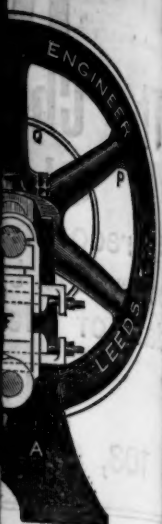


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No. 3193.—VOL. LXVI.

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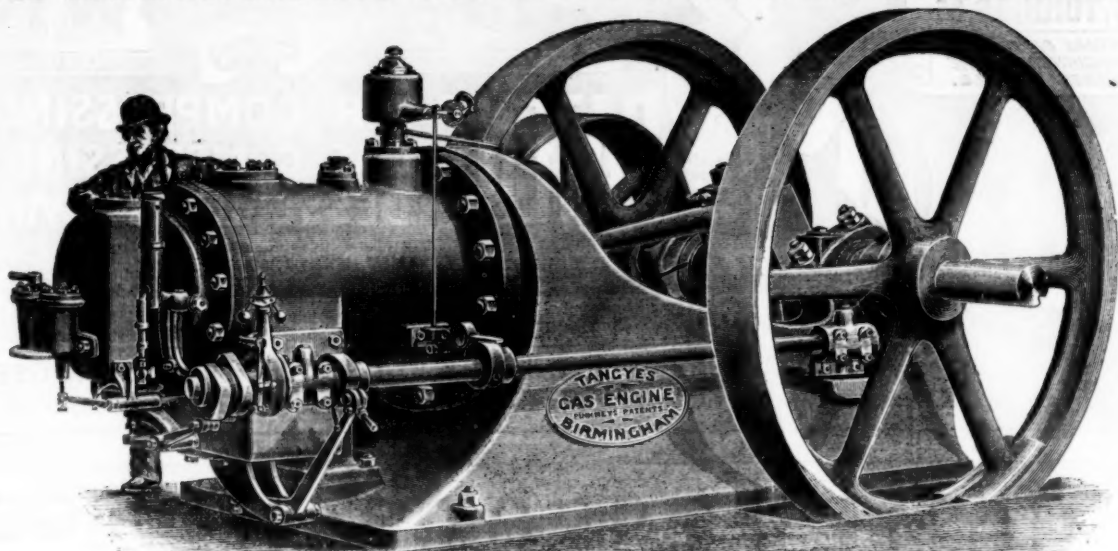
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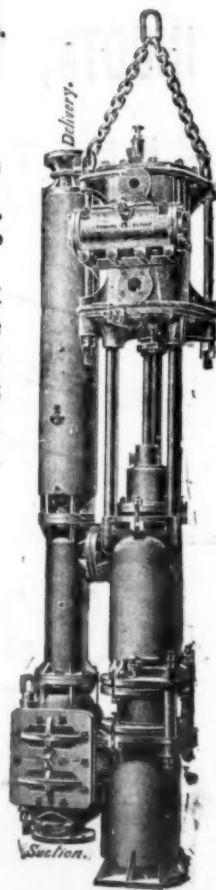
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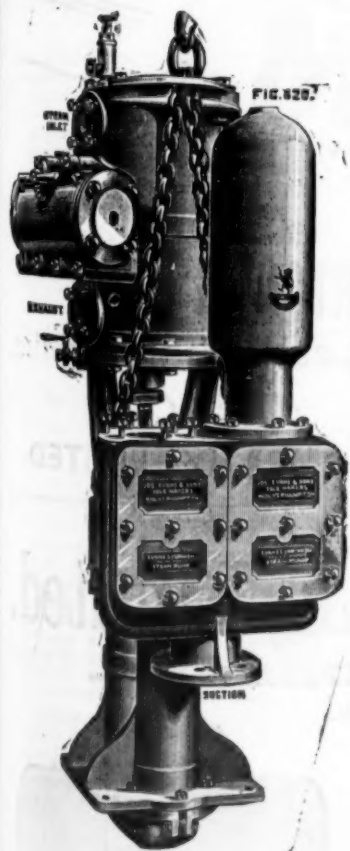
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HORSE PUMPS,  
POWER PUMPS,  
AIR COMPRESSORS,  
&c.



'STRAIGHT-LINE' PATTERN SINKING PUMP



GRIFF" PATTERN "CORNISH" SINKING PUMP.

# CULWELL WORKS, WOLVERHAMPTON.



**WALKERS' PATENT INDESTRUCTIBLE VENTILATING FANS FOR MINES, TUNNELS, &c.**  
 CONSTRUCTORS OF THE VENTILATING MACHINERY AT THE SEVERN AND MERSEY TUNNELS.

**PATENT ANTI-VIBRATION SHUTTER**  
 Applicable to all enclosed fans

**BROTHERS**

**Engineers, Pagefield Ironworks, WIGAN.**

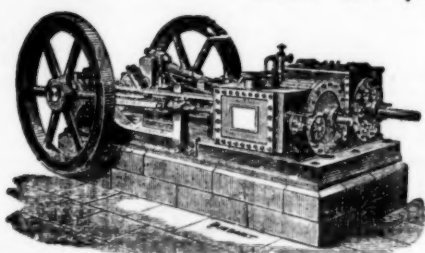
**WALKER PATENT** AIR COMPRESSING ENGINES  
 GAS COMPRESSING ENGINES  
 BESSEMER BLOWING ENGINES

upwards of 400 of the above now AT WORK indicating in the aggregate 150,000 Horse-Power

**Fisher & Walkers' Patent Friction Clutch & Underground Haulage Machinery**  
 THIS GEARING IS NOW EXTENSIVELY IN USE FOR HAULAGE PURPOSES. \*  
 The objects attained are SIMPLICITY, ENDURANCE OF THE MACHINERY AND ROPES with a MINIMUM EXPENDITURE OF POWER.

## AIR COMPRESSORS

With Compound Air and Steam Cylinders,  
 Fitted with SCHRAM'S Inlet and Outlet Valves giving the greatest efficiency.



### SCHRAM'S IMPROVED Rock Boring Machines.

Supplied to the Indian, Colonial, and other Governments.  
 2500 IN USE in all PARTS of the WORLD.

### DIAMOND PROSPECTING DRILLS.

### "OPTIMUS" COMPOUND ROCK DRILL.

(P. J. OGLE'S PATENT.)

Consumes 40 per cent. less Compressed Air than any other Drill at the same time giving the most effectual results.

ESTIMATES AND FULL PARTICULARS ON APPLICATION.

**RICHARD SCHRAM & CO., 17a, Great George Street, Westminster, S.W.**

TELEGRAMS: "SCHRAM, LONDON," A1, A.B.C. and The Engineering Telegraph Codes Used.

## GEORGE GREEN, FOUNDRY, ABERYSTWYTH.

SILVER MEDALS AWARDED AT THE ROYAL CORNWALL POLYTECHNIC, 1872 & 1876; GOLD MEDAL AWARDED AT THE GREAT INTERNATIONAL MINING EXHIBITION, CRYSTAL PALACE, 1890.

ONLY AWARDS GIVEN FOR CONCENTRATION PLANTS

### GREEN'S LATEST IMPROVED Self-Acting or Automatic Ore Dressing Machinery.

A Special Plant, on a reduced scale, has been erected at the Works by which samples of METALLIC ORES up to Five Tons may be treated, and the commercial value determined. In this way the most suitable arrangement of Plant is ascertained, a considerable advantage to intending Purchasers of Crushing and Concentrating Plant.

**GOLD STAMP AND OTHER MILLS.**  
 Estimates, Catalogues, and Full Particulars on Application.

Telegrams—Green, Foundry, Aberystwyth.

## For PURE ALUMINIUM

98 to 99½ per cent. (98 per cent. minimum guaranteed) in

### INGOTS, STICKS, & ROLLING SLABS;

ALSO FOR

SHEETS, &c., AND  
 FERRO-ALUMINIUM.

# ALUMINIUM.

APPLY TO

**HENRY R. MERTON & CO.,**

2, Metal Exchange Buildings, Leadenhall Avenue.

**LONDON, E.C.**

AGENTS FOR THE BRITISH ALUMINIUM COMPANY, LIMITED.

## A. & J. STEWART and CLYDESDALE, Limited.

Glasgow, Coatbridge, and Mossend.

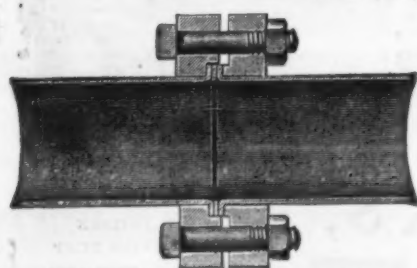
WROUGHT IRON WELDED TUBES and FITTINGS for GAS, WATER, and STEAM.

Light Lap-welded Wrought-iron and Steel Tubes  
 (SPECIALLY ADAPTED FOR MINES).

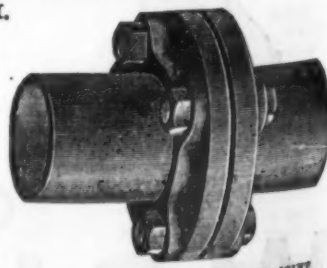
With Patent Flanged Joints (as illustrated) for the Conveyance of Water, Steam, and Air, at High and Low Pressures.

LAP-WELDED IRON AND STEEL BOILER TUBES  
 FOR LOCOMOTIVE, MARINE, AND OTHER MULTITUBULAR BOILERS.

**STEEL & IRON PLATES FOR BOILERS, BRIDGES, &c.**



SECTION OF PATENT FLANGED JOINT



PLAN OF PATENT FLANGED JOINT

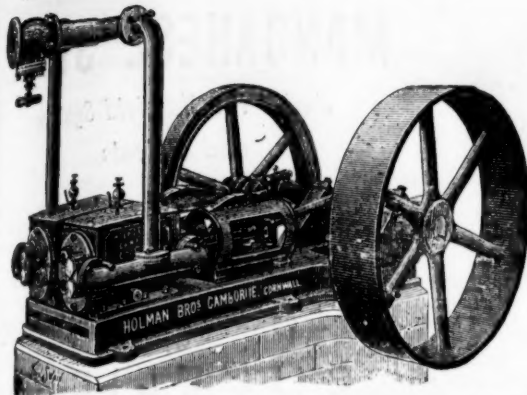
Head Offices: **41, OSWALD STREET, GLASGOW.**



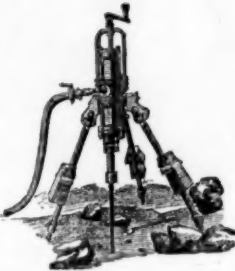
# HOLMAN Bros., Camborne, Cornwall.

ESTABLISHED 1839.

Patentees and Sole Makers of  
"THE CORNISH" ROCK DRILL and "THE CORNISH" COMPRESSOR.



FIRST  
SILVER MEDAL,  
Highest Award,  
Mining Institute  
Contest, 1881.



FIRST  
SILVER MEDAL  
Highest Award,  
Royal Cornwall  
Polytechnic  
Jubilee Exhibition  
Contest, 1882.

Three Makers  
represented.

Five Makers  
represented.

AWARDED SILVER MEDAL INTERNATIONAL  
INVENTIONS EXHIBITION, 1885.

## RECORD OF WORK DONE

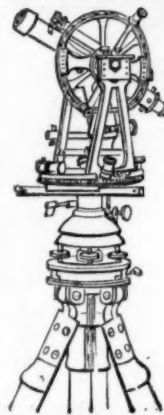
At Botallack Mine, St. Just, Cornwall, **TWELVE MEN** with **TWO** new Patent **CORNISH ROCK DRILLS** drove, sunk, and rose **288 FATHOMS** in **12 MONTHS**, equal to five times the Speed of Hand Labour  
At Wheal Grenville Mine, Camborne, Cornwall, **SIX MEN** with **TWO** new Patent **CORNISH ROCK DRILLS** started from the **150 FATHOMS** level and put up in **EIGHT MONTHS** a **11 FEET** by **5 FEET PERPENDICULAR RISE 46 FATHOMS 5 FEET 6 INCHES**, and about midway drove **1 FATHOM 5 FT.** No communication of any kind was effected until holing to the Shaft brought down from surface.

Estimates for **ROCK BORING PLANT** and **GENERAL MINING MACHINERY** on Application.

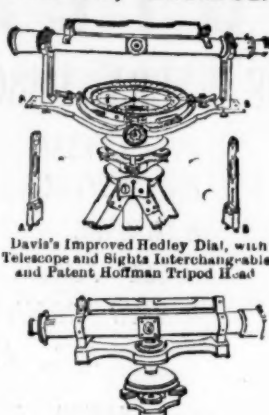
London Offices: 7 and 9, LEADENHALL BUILDINGS, E.C.

# JOHN DAVIS AND SON.

ALL SAINTS WORKS, DERBY;  
118, NEWGATE STREET, LONDON.



Transit Theodolite with Patent  
Hoffman Tripod Head, and  
Trough Compass.



Dumpy Level with  
Hoffman Patent Tripod Head.

**MINING, SURVEYING, AND  
ENGINEERING INSTRUMENTS.**  
THEODOLITES. LEVELS. TACHEOMETERS.

Davis's Improved Hedley Miners' Dials, with  
**HOFFMAN PATENT TRIPOD HEAD;**  
AND ALL DESCRIPTIONS OF MATHEMATICAL AND  
MINING SURVEYING INSTRUMENTS.

Revised Illustrated Catalogues Free to any Part the World.  
SECTION (A) MATHEMATICAL DEPARTMENT AND SAFETY LAMPS  
SECTION (B) ELECTRICAL DEPARTMENT.

Gold Medal Awarded Mining Exhibition, 1890.  
A. B. C. CABLE CODE, 4TH EDITION.

Jeffrey Electric Coal Cutter and Drill may be seen at work in the  
Model Mine, Cardiff Exhibition, Instruments, &c., Stand No. 315.

**AWARDS:** CRYSTAL PALACE, 1890; TASMANIA, 1891; KIMBERLEY, 1892.

# CONCENTRATION.

The Clarkson-Stanfield Ore Reduction Co. (Limited).

In the CLARKSON-STANFIELD process of Concentrating Refractory and Complex Ores no water is required; dust is reduced to a minimum; the loss of Mineral through water-borne Slimes is obviated.

**OUTPUT 1/2 TO 2 TONS PER HOUR, ACCORDING TO SIZE OF MACHINE.**

CONCENTRATOR TO BE SEEN IN OPERATION AT THE COMPANY'S ONLY ADDRESS,

**6, COLONIAL AVENUE, MINORIES, LONDON, E.**

The Machine is superior to Sieves for Sizing Homogeneous Substances, such as Emery, Sand, and Powders, and may be used to great advantage in the preparation of Ochre.

RE-The owners of the Carnadochan Mine, near Bala, North Wales, will, by arrangement, show their CLARKSON-STANFIELD plant working on a Refractory Low Grade Gold Ore.

## NEW PATENTS.

LIST OF APPLICATIONS for New Patents relating to Mining Metallurgical, Engineering, Railway and kindred matters, specially compiled from official sources for the "Mining Journal" by Messrs Rayner and Company, Patent Agents, 21, Chancery Lane, London, W.C., who will forward all information regarding them free on application.

- 2298 Francis Stewart Banner, 37, Chancery Lane, London.-Improvements in gas, petroleum, and like engines.
- 2295 John William Clarke, 36, Chancery Lane, London.-Improvements in and connected with amalgamating apparatus for extracting gold and silver from their ores.
- 2292 John Henry Lollar Ewin, 6, Lord Street, Liverpool.-Improvements in or in connection with gas and oil engines.
- 2278 James Wood and William Wallace Clarke, 4, South Street, Finsbury, London.-Improvements in machinery or apparatus for crushing and grading ores, quartz, and other materials.
- 2293 John Joseph Finkler, 4, Corporation Street, Manchester.-Improvements in water-tube steam generators.
- 2290 Edward Joel Pennington, 45, Southampton Buildings, Chancery Lane, London.-Improvements relating to the attachment of fly wheels to engine crank shafts.
- 2291 Edward Joel Pennington, 45, Southampton Buildings, Chancery Lane, London.-Improvements relating to internal combustion engines.
- 2294 Frederick Lumphough, 23, Southampton Buildings, Chancery Lane, London.-Improvements in high or low pressure steam traps.
- 2293 James Neil, 35, Walbrook, London.-Improvements in rocking and dumping furnace grates.
- 2288 Walter Mackenzie Smith, 18, Otterburn Terrace, Jesmond, Newcastle-on-Tyne.-Improvements in steam engines.

EXTRACT FROM A LECTURE ON "FOODS," BY DR. ANDREW WILSON.-"The consumption of cocoa happily increases year by year. I say 'happily,' because, as tea and coffee are not foods, while cocoa is a true food, any increase in the rational nutrition means an increase in the national prosperity. Winter, besides, is close upon us, and I advise those who are susceptible to colds to fortify themselves against chill by attention to their food. The easiest way of affecting this end for many is to substitute cocoa (cocoa being the most nutritious) for tea and coffee."

HUNGARIAN LIGNITE DEPOSITS.-It is stated that some important deposits of lignite have lately been struck in the Banat district of Croatia.

CITY AND GUILDS OF LONDON INSTITUTE.-We have received a copy of the report on the work of the department for the session 1895-96, which is an instructive record of the excellent work the Institute is performing in technological education.

The directors of the DEBENTURE SECURITIES INVESTMENT COMPANY (LIMITED) have declared interim dividends of 4 per cent. per annum on the preference shares, and 5 per cent. per annum on the ordinary shares, carrying £250 to reserve, making that account £16,250 in 11 months.

THE BROKEN HILL WATER SUPPLY (LIMITED) have declared a dividend (the 13th) of 3d. per share. Shareholders on the London register will receive warrants from the office, 97 and 99 Bishopsgate Street, E.C.

## JOINT-STOCK COMPANIES.

### NEW REGISTRATIONS.

THE following are among the joint-stock companies registered at Somerset House since our last notice:-

- Bayley's United Gold Mines (Limited).-Registered October 16 by Carpenter and Thompson, Broad Street House, E.C., with a capital of £150,000 in 5s. shares, to acquire and take over as going concerns the undertaking of the Bayley's Reward Claim Gold Mining Company (Limited), and the undertaking of the Bayley's Reward No. 1 South Gold Mining Company (Limited).
- Triumph Leases (Limited).-Registered October 17 by Clarke, Rawlinson and Co., 66, Gresham House, E.C., with a capital of £50,000 in £1 shares, to acquire and deal with properties in Western Australia and in the copious language of the prospectus-to win, get, quarry, crush, smelt, calcine, refine, dress, amalgamate, manipulate, and prepare for market ore, metal, and mineral substances. Registered office, 30, St. Swithin's Lane.
- Beacon Gold Mines (Limited).-Registered October 17 by Clarke, Rawlinson and Co., 66, Gresham House, E.C., with a capital of £100,000, in £1 shares, to acquire any mines, mining rights, landed property, &c., in Australia or elsewhere; to deal with and turn to account the same. Registered office, 20, St. Swithin's Lane.
- Hauraki Main Lodes (Limited).-Registered October 15 by Snell, Sons, and Greenup, 1 and 7, George Street, Mansion House, E.C., with a capital of £150,000, in 1,200,000 shares of 2s. 6d. each, to acquire two special mining claims and properties situated in the Coromandel Survey district in the district of Auckland, New Zealand, and known as the Albion Special Claim and the Albion Extended Special Claim. Registered office, 3, Prince's Street, E.C.
- Anglo Chinese Exploration, Development, and Trading Company (Limited).-Registered October 19 by W. Tanner and Co., 3, Circus Place, E.C. Capital £50,000, in £1 shares. To carry on in all or any of their respective branches the businesses of bankers, capitalists, company promoters, financiers, carriers, shippers, underwriter, concessionaires, engineers, manufacturers, general merchants, traders, &c.; also as dealers in gold and precious stones, iron, copper, coal, timber, petroleum, oils, tea, coffee, sugar, rice, camphor, opium, silk, cotton, and woollen stuffs; as miners and workers of mines and minerals. Registered office, 3, Circus Place, Finsbury Circus, E.C.
- Alabama Gold Mining Company (Limited).-Registered October 17 by Hays and Co., 21, Abchurch Lane, E.C. (capital £120,000, in £1 shares), to acquire lands, concessions, grants, privileges, mines, mining, water and other rights which may seem to the company capable of being turned to account, and to explore, work, develop, carry out, exercise and turn to account the same.
- Harbinger (Gippsland) Gold Mine (Limited).-Registered October 20 by Stanley, Woodhouse and Heddewick, 45, Ludgate Hill, E.C. (capital £100,000, in £1 shares), to prospect and explore for the purpose of obtaining information, and also to acquire and enter into contracts and engagements of any description with respect to lands, forests, harbours, mines, mining rights, minerals, water rights, rivers and property of every or any nature situated in Australia or elsewhere, and to negotiate for and acquire concessions, privileges and rights from any sovereign, powers, governments or states.
- Grimsthorpe Colliery Company (Limited).-Registered October 20 by Waterhouse Brothers and Layton (Limited), Birch Lane, E.C. Capital £250,000, in £100 shares. Object: To carry on in all or any of their respective branches the businesses of coal masters, coal miners, ironstone getters, ironmasters, steel makers, limestone getters, brick makers, coke and patent fuel makers, brick and stone merchants, wagon builders, farmers.
- McCulloch Coolgardie Gold Mines (Limited).-Registered October 19 by Blyth, Dutton, Hartley and Blyth, 112, Gresham House, Capital £20,000, in £1 shares. Object: Primarily to adapt and carry into effect an agreement providing for the sale to this company of the shares, stocks, undertakings, and assets of the old company, in particular three mineral properties, known as blocks Nos. 23, 25, and 255, situated in the Coolgardie gold field, West Australia.
- London and Provincial Mining Corporation (Limited).-Registered October 15. Capital £1000 in £1 shares. Object: To adapt an agreement with A. D. Marshall, and to carry on mining and smelting operations in any part of the world.

## CONTRACTS OPEN:

FOR MINE, QUARRY, RAILWAY, AND ENGINEERING WORK, STORES, &c.

\*We shall be obliged by being promptly placed in possession of particulars regarding contracts open for competition, and of the results of successful tenders. In the latter case contract prices should be given.

The date given is that by which tenders must be delivered, in nearly all cases further information can be obtained on application at the addresses given. In applying for such tenders as "The Mining Journal" shows to be mentioned as the original source of the information, concerning which further particulars are required.

- Repairing Crane, November 2 (Whitehaven).-For the rebuilding and repairing of 10 ton crane, for the Whitehaven Harbour Commissioners, in accordance with a specification and plan, copies of which can be obtained on application to Mr. J. S. Brodie, harbour engineer, Town Hall, Sailed ten tenders, endorsed "Ten ton Crane," addressed to Mr. John Tyson, clerk, Harbour Office, Whitehaven, must be delivered by 2 p.m. on November 2.
- Railway Stores, November 3 (London).-For supply of ironmongery and miscellaneous stores, for the Assam-Bengal Railway Company (Limited). Specification and tender forms can be obtained at the offices of the company, Bishopsgate House, 55 and 56, Bishopsgate Street Within, London, E.C. O each specification a fee of £1 1s. is charged, which cannot under any circumstances be returned.
- Bridge, November 4 (Cagliari, Sardinia).-For a three-span iron viaduct over the Fiumedusa (mountain torrent). About £21,000. Particulars at the Prefecture at Cagliari, or the Italian Ministry of Public Works, Rome.
- Railway, November 5 (Manchester).-For the construction of a short railway in the City of Manchester, about 15 chains in length, commencing by a junction with the railway of the Cheshire Lines Committee at or near Beaufort Street, and terminating on the north side of Great Bridge Street, for the Great Northern Railway Company. The working drawings may be seen, and specifications, bills of quantities, and forms of tender obtained at the Engineer's Office, King's Cross Station, London.
- Railway, November 8 (Sofia).-The Saremba and Yenl Zagra railway contract, of which various particulars have appeared, is now advertised for November 8 as the date of sending in tenders. Application should be made for particulars to the Bulgarian Ministry of Public Works at Sofia.
- Road Widening, November 9 (Abergavenny).-For widening the Pen-biddle Lane, by making passing places, and other improvements, for the Abergavenny Rural District Council. The plan and specification can be seen at the residence of Mr. John Gill, surveyor, North Street, Abergavenny. Tenders to be sent to Mr. James H. Farquhar, clerk for highway purposes, Market Street, Abergavenny, by November 9.
- Coal, November 10 (Alexandria).-For the supply of 5000 tons of Cardiff coal in January and 2000 tons in May next to the Khedivial mail steamers. Delivery at Suez customs free. Tenders, on stamped paper, to the Direction at Alexandria by November 16. Security required.
- Coal, November 11 (Cronwall, Hants).-For the supply of from 80 to 90 tons of coal, to be delivered at Fleet Station between November 21 and December 1, for the trustees of the Crookham and Emsay Fuel Fund. Application, stating quality, &c., to be sent to Mr. Jesse Hoar, clerk to the trustees, Itchen Lodge, Cronwall, by November 11.
- Goods Wagons, November 19 (Christiansia).-For the supply of 40 goods-wagons and one luggage van to the Norwegian State Railways. Particulars at the Manager's Office. Address Iernbaestovet 8-9, Christiansia.
- Coal, November 30 (Cairo).-For the supply of Newcastle coal and also coke for the Government hospitals during the year 1897. Application must be made to the Chief Storekeeper of the Sanitary Service at Cairo, and tenders must be on stamped paper, and quote the prices in Egyptian money.
- Coal (Birmingham).-For supply of coal for boiler use over 12 months, 1500 tons, to be increased as required, for the Tubless Pneumatic Tyre and Capon Hoston (Limited), Hazliwell and L'Hord Mills. Tenders to be addressed to Lifford Mills, Birmingham.



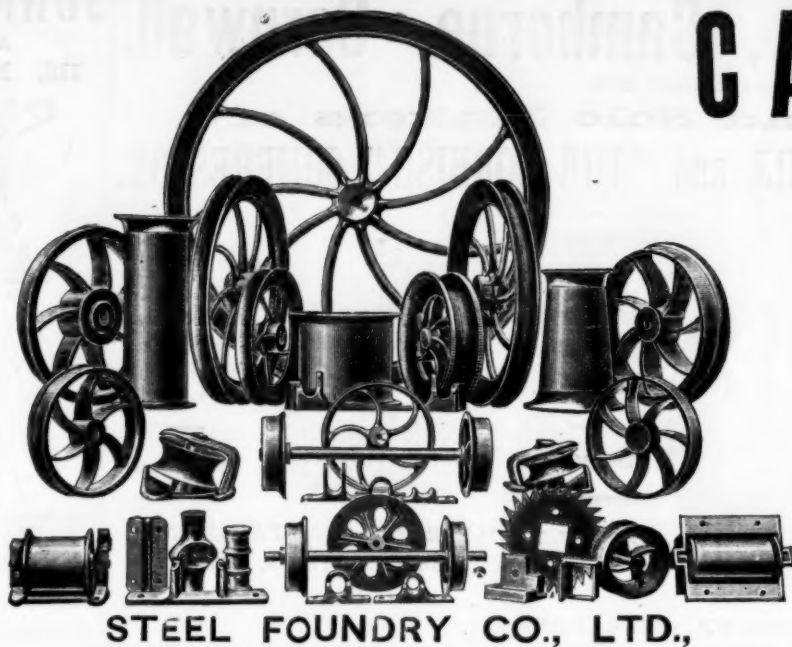
# STEEL

## OF EVERY DESCRIPTION.

TOOL STEEL,  
DRILL STEEL,  
HAMMERS,  
STEEL FORGINGS,  
MINING REQUISITES,  
ETC., ETC.

FOR  
COLLIERIES, MINES, QUARRIES, ETC.

### HADFIELD'S



STEEL FOUNDRY CO., LTD.,

# CASTINGS

Sole Makers of  
**MANGANESE STEEL**

Under the Hadfield System  
and Patents.

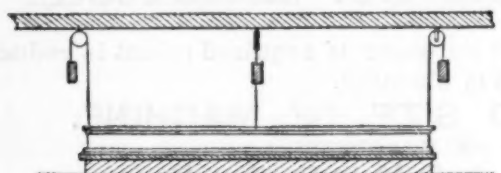
TUB WHEELS AND AXLES

Fitted by Hadfield's Fast Method,

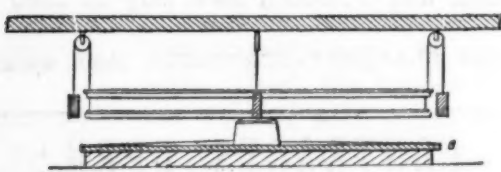
### SHEFFIELD.

### ROBSON'S IMPROVED BUDDLE.

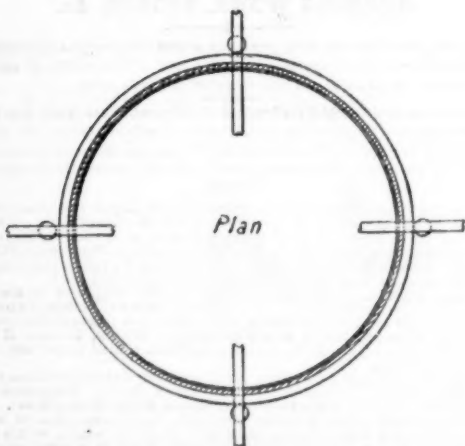
THE improvement which the inventor has introduced in the ordinary type of the round buddle is simply intended as a labour-saving device. It has been the usual practice to sink the buddle down to the level of the floor line of the buddle shed. The time and physical labour required for the emptying is, as every one knows, far longer, and therefore more expensive than it ought to be, consequently an improvement which would effect a saving in both cases, without increasing the cost to any great extent, would surely commend itself to the mineowner, the millman, and the labourer. As shown in the illustration, this new form of buddle is raised to any convenient height above the floor line. At the top of the circular ring of stone or brickwork, and on the outer edge and projecting over the edge a little, a properly jointed wooden ring is fixed right round. The bed or inclined floor of the buddle may be of wood or cement, and forming a joint with the wooden circular ring. The sides of the buddles are formed by a wrought iron or steel ring 3-32 in. in thickness, strengthened at the top by a light angle iron running right round on the outer edge. At the bottom a groove is formed by two angle irons, the outer one being inverted and rivetted to the other one, thus forming a groove



Elevation



Elevation showing Ring removed



Plan

between it and the sheet iron or steel ring. Into this groove a piece of ordinary I.R. tubing, with the ends cemented together, is squeezed, thus giving it an oval form; this projects downwards below the edge of the ring and the angle iron, and rests upon the wooden ring, thus making a perfectly tight joint. To four points of the ring eyes connecting with chains or ropes are attached, and each passing over a pulley have a balance weight attached at the other end. When it is required to empty the buddle the ring is raised by means of the weights and chains, and hooked up clear of the charge to be removed. A boy then simply gets inside and cuts round the charge, whilst another by means of a rake draws off the contents. The tailings, middles, and heads can be separated as desired. The ring is then returned to its place, and the balance weights in turn hooked up in order to allow of the full weight of the ring to press on the I.R. pipe, which makes the joint below. It is obvious that by putting the next buddle a little below this first one, that the middles (say) may be rebuddled; it is only necessary to keep the top of agitator trough and trommel on the level of the previous floor line that the stuff has not to be lifted again, but only drawn by means of a rake into the agitator. The same applies to the heads and tailings, should the former require and the latter be worth rebuddling. It has been found by practical working of this new type of buddle that the time required for emptying is only from one-third to one-quarter of the time formerly required by the old method. The ring is made in

four or more parts for shipment accurately fitted and holed ready for putting together when in position on the bed of the buddle, and are manufactured by Messrs. Johnson and Phillips, Old Charlton, Kent.

### MINING IN VICTORIA.

£140,000 SUBSIDY TO MINING.

(FROM OUR OWN CORRESPONDENT.)

DIRECT pecuniary assistance to the mining interests of the colony is one of the latest proposals to the Government. Altogether it is proposed to devote £140,000, and very wisely it is intended to expend the money in several definite directions. The plan of distribution is embodied in a bill drafted by the Minister of Mines (Mr. H. Foster) and was circulated during the week. Out of the total £75,000 may be set aside for assisting companies which are doing pioneering work, but only £25,000 can be spent annually. The money is to be expended in sinking or driving, or in obtaining machinery and appliances for carrying on such pioneering mining. Every application must be referred to the Government Geologist, who will report as to the character of the lead or reef which it is proposed to develop, whether the operations are of a pioneer character, and whether there is reasonable probability of the work proving remunerative. No company can be advanced more than £10,000, and no instalment of the amount it is proposed to advance shall be paid until the Treasurer of the Colony is satisfied, by the production of vouchers, that for every £1 to be advanced under the Act, the company has out of its own capital previously expended an equal sum of £1. Interest will be charged for the money advanced at the rate of 3½ per cent. per annum. The repayment of the loan is to be made a first charge on the profits, assets, and uncalled capital of the company. The construction of roads and trucks for mining is an important feature of the Government proposals. The expenditure under this head is limited to £45,000, of which not more than £15,000 can be spent in any one year, and will be confined to outlying and mountainous parts of the colony, and on application by Shire councils. Any council applying for the construction of such a road or track must undertake to keep it in repair when made.

Provision is also made in the Bill to spend a sum of £10,000 in establishing plant for testing auriferous material. Such plant can only be erected in districts where there is no battery, or where, in the opinion of the Minister, it is required, and the charge for using the appliances shall be fixed by the Governor in council. A sum of £7000 is to be devoted to cutting races to convey water for sluicing alluvial deposits. A report on each race, which it is proposed to construct, must be furnished by the Government Geologist as to the nature of the deposits, &c., and whether the work will enable mining to be carried on at a profit. The last item in the scheme is provision for advertising the mineral resources of the colony throughout the civilised world. Under this head £3000 is to be spent. Most of this item will be disbursed by Mr. James Stirling, the Assistant Government Geologist, in disseminating information while in England and on the Continent. Editor and business managers of the financial and mining Press will carefully clip out the last paragraph. They will have the pleasure of meeting Mr. Stirling in London early in November. The Government scheme promises the very best results, and though it should be found not to work so well in some directions as is anticipated, it will still be immeasurably superior to any project for a similar end that has preceded it. In years not long gone by what was termed a prospecting vote was distributed by the Government of the day acting under the advice of "prospecting boards," and, though some good resulted, it was altogether out of proportion to the money thus spent, a very large percentage of which was literally wasted. Intentions, no doubt, were very good, but most of the money was directed into unprofitable channels, unprofitable because it was not the means of accomplishing the end designed, although it benefitted the individuals into whose pockets it went. Thus, when the prospecting vote was abolished, the mining industry really did not suffer, though possibly some miners did, but at the same time a wrong was done to mining, which, having accomplished much in every way for the colony, merited practical assistance when it from various causes began to languish. The mistake was in not devising an effective scheme for aiding the mining industry. It has remained for the present Minister (Mr. Foster) to discover a method of subsidy which promises to result in very large enhancements, and avoid original errors.

The policy of subsidising the mining industry does not admit of question. Various departments of the agricultural industry

of the colony have been provided for as circumstances and judgment required. Mr. Sinclair, a commercial commissioner, is at present in England to find a market for the colony's produce. Therefore, the Government cannot be accused of partiality when it is proposed to help mining. The only charge to make is that in proportion to its national value as a revenue-producing source and means of employment for her population, Parliament does not deal with the Mines Department in a more liberal way. Every digger and speculator on the market knows that it requires more than gold in a mine to make it go. It requires the assistance of capitalists, who can only be reached by putting information before them in a proper way. If the whole of the £140,000 was spent in bringing the colony's resources under notice, it would be money well spent. For in this direction the Government has a worthy example in the enthusiastic efforts of the Bendigo Development Association, promoted by Mr. Alexander Bayne, Chairman of several Bendigo mines, and Mr. Mackay, of the Bendigo Advertiser. This association during the five years of its existence, by the publication of plans and reports concerning the Bendigo field, has given its rich quartz reefs world-wide fame. The fruits of such publicity are now being reaped in the increasing monthly yield of its mines.

What is wanted in connection with Victorian mining is more information and more publicity in the world's centres. If it were sought to bolster up worked-out diggings no condemnation could be too emphatic, but recent discoveries, as the result of the expenditure of public money, make it clear that Victoria contains abundance of gold.

Assistance to mining is wise also when we have regard to the thousands of our population which are leaving Victoria weekly for South Africa and Western Australia. This step will cause the tide to turn, for it only requires judicious representation on the part of Mr. Stirling to make known the scores of good things that are available in Victoria for the legitimate investment of English capital.

### Track Cutting.

The track-cutting policy of the present Minister is thoroughly justified by the results. A recently issued report gives the mileage of tracks cut during 1895. During the term referred to tracks were cut in the three mining districts of Beechworth, Gippsland, and Castlemaine, at a total cost of £4079, £3376, and £700 respectively, and, taking the mile average, those of Gippsland did not cost half as much as those in the two other districts. The particulars are:—Castlemaine, 44 miles costing £28 3s. 7d. per mile; Beechworth, 181 miles, £22 1s. 9d. per mile; Gippsland, 333 miles costing £10 1s. 5d. per mile. The tracts in the Castlemaine district were those cut through the valleys and along the spurs of the Upper Yarra. The total mileage cut for the whole of the colony in 1895 was 558 miles at a total cost of £8155, and the direct aid has been very encouraging. The track from Harrietville to Razorback has led to 15 discoveries of quartz veins, and the investment of a capital of £100,000 for their development. The other tracks cut in the same region have led to the settlement of about 700 miners, some located on highly auriferous reefs, and the probability is that these men are but the pioneers of a great mining population. The same may be said of the tracks cut in the Upper Yarra district which have enabled prospecting operations to be carried on on the Victorian Mount Morgan field and led to discoveries on Big River. Notwithstanding that Gippsland will receive most attention in the future; for about £20,000 out of the proposed subsidy of £45,000 is to be spent on track cutting in this district, it will justify the expenditure and so far as Eastern Gippsland is concerned—i.e., the county of Croajingolong—it will practically mean the addition of a new province to the colony.

### The Iron Mask Mine.

One good effect of cutting tracks through Eastern Gippsland has been the discovery of several rich mineral deposits; these differ materially from others in the colony, inasmuch as they carry gold, silver, copper, lead, manganese, barytes, calcites, &c., more or less in combination, and are associated with porphyritic matrices protruding through Silurian metamorphic schists, also carboniferous limestones and shales. Notably is this the case in the region between the town of Bruthen and the port of Cunningham, and the country east of the Tambo River. Amongst these newly-opened ore deposits that of the Iron Mask claim deserves a prominent position. Its characteristic feature is marked by a massive outcrop of finely-crystalline Pyrolusite, which forms the Iron Hat so well known at the Broken Hill Silver and Mount Lyell Copper Mines and elsewhere. This huge formation—it cannot be called a lode—has been found within one wall only at present, and the width of over 60 feet has not so far indicated the opposite wall, besides which it has been traced for over 2 miles. Some 16 leases along the line have been taken up, besides the original 30 acres held by the Iron Mask Company.

Assays have been made of the orebody by well-known assayers taken from surface, and at some depth beneath it; such assays give the average contents at 1 ounce 4 dwts. of gold and over 2 ounces of silver per ton, giving an average value at present of over £23 to the ton. The manganese it is held would pay all of working expenses, and there are about 160 to 200 feet of "backs" ready for immediate mining operations. With all these kinds of mines which show low grade silver ores at surface



It has been found in Australasia that atmospheric and chemical influences have caused the "leaching" out of that metal, but it is not known how much of the metal is lost in this way. The fact that the metal is lost in this way is a very material objection in the case of Mr. G. Thureau (late Government Geologist and Chief Inspector of Mines, Tasmania) has furnished a lengthy report on the mine. I understand it is the intention of the present proprietors to float the Iron Mask on the London market. At a moderate price the property should meet with success. For I hear nothing but good concerning it, and present ore values have not been over-rated.

#### New Rich Discoveries.

A new and important find is reported on the Dividing Range between Sheepscot Creek and the Haunted Stream, in Eastern Gippaland. A prospecting party have found five reefs, not one of them being less than 3 feet wide. The reefs are running parallel, nearly due north and south, and the stone is of a very fine quality, being solid in character, and carrying gold in all the reefs from wall to wall. One has been cut into for 12 feet, and the opposite wall has not yet been found, so that the size of this discovery has not been ascertained; but the satisfactory feature about it is that, as is usually the case in these large formations, the gold is not contained in veins but is distributed all through the formation.

Another reef has been sunk to a depth of 20 feet, the stone being mineralised, solid, and about 3 feet wide. There has been no time to prospect all the reefs connected with this find to form any conclusive idea as to their size and character, but that they are of value is shown by the good prospects which have been obtained, and the regular manner in which the gold is dispersed through the stone. Assays made give over 4 ounces of gold to the ton. The ground has all been taken up in the vicinity by local people, and it is intended to erect a battery with the least possible delay.

Reports have been received by the Mines Department of a new gold discovery in the Pyrenees, about 6 miles from Percydale. On September 21 a party of prospectors brought in a bag of very rich specimens obtained from a reef 5 feet wide, found some 3 feet or 4 feet below the surface, estimated to yield over 10 ounces to the ton. Several leases along the line have been applied for. Another discovery of gold was recently made at Surrey Hills, 8 miles eastward from Melbourne. The specimens brought in are principally of white vitreous quartz, carrying both coarse and fine gold, but some pieces of quartz are stony in character.

#### Amalgamation of the Bailey's Gold Companies, W.A.

An extraordinary general meeting of Bailey's Reward and Bailey's Reward No. 1 South was held in Melbourne on September 21, for the purpose of considering a scheme of amalgamation. I attended the meeting. There were 15 persons present, including officials, solicitors, and everybody else unattached. Mr. Bailey, the discoverer, was present, and made serious charges against the management in connection with the working of the mine and disposal of the gold; while speaking, some friends pulled him out of the room, therefore the world has lost whatever remained to be said by him in connection with this mine. Mr. McKinnon, of Messrs. Blake and Riggall, the well-known firm of solicitors, read the draft agreement to the meeting. The scheme was carried for amalgamation on a show of hands. Proxies to the extent of 103,912 shares out of 480,000, the total number of shares in the Reward claim, was presented at the meeting. Those were made up of 57,169 shares on the London register in favour of the scheme and 445 shares against, 45,898 shares on the Colonial register were in favour of the scheme and 400 against, the combined total being 103,067 shares for amalgamation, and 845 against. In the Bailey's Reward No. 1 South meeting, which was held immediately after, and attended by the same people, except with the difference that Mr. Molesworths, General, who presided at the Reward meeting, gave up the chair to his co-director, Mr. Everard Brown, the same form and the same show of hands were gone through. In connection with the South meeting, proxies to the extent of 26,253 shares were presented. Of these 9988 shares on the London register were for amalgamation and 100 against. On the Colonial register 15,744 shares were in favour of the scheme, and 423 against. A combined total of 26,252 shares out of 106,000 (the total number in the company) were represented at the meeting.

The new company is to have a capital of £155,000, divided into 620,000 shares of 5s. each; 586,000 (the total number of shares in the Reward and No. 1 South) will be issued to the shareholders of the two companies in exchange for their old shares paid up to 3s. 9d. The balance, 34,000 shares, are reserved for the directors in the new company to issue for the purchase of Bailey's No. 1 North and Ford's Hill, a syndicate, by the way, composed of the original vendors, S. Brown and Co. It is just as well the English public understood the position of affairs. The original holders of No. 1 South shares bought them at £1. These were subsequently divided into three, making the cost to each original holder of present shares 6s. 6d. The Reward original holders also paid £1, but their shares have been sub-divided by 20, making the cost to them of present shares 1s. By the reconstruction scheme the No. 1 South shareholders will get a 3s. 9d. share for their 6s., while the Reward shareholders get a 3s. 9d. share for their 1s. Very good for the latter, but a considerably bad deal for the former, and it is scarcely to be hoped that the amalgamation will improve their value, for it is well known the No. 1 South Mine is the better of the two.

Advices were received in Melbourne on September 22 that No. 1 South had just put through a crushing of 70 tons for 22 ounces, and had struck a big flow of water on their south boundary. Another meeting of the two companies will be held in Melbourne in about a fortnight to confirm the resolutions passed. I remember the enthusiasm and prophecies at the first meeting of these companies. What a difference betwixt then and now. At the one, Messrs. Sylvester, Brown, and Co., speaking of blocks of gold for the shareholders, and at the other Mr. Bailey, the discoverer, denouncing all and sundry persons in connection therewith. As the saying goes, Well, better luck next time! Let us hope the new company will pay shareholders' losses in the old, the head office of which will, after the next meeting, be removed to London.

**NEW MINING IN BURMAH.**—Advices from India state that a new ruby-bearing tract is being worked in Upper Burma. It is in the neighbourhood of Nanyaseik, in the Mogawng district, and it seems to promise well. Last November rules under which natives could obtain permission to mine were introduced, and a system of licences was put into force. It was found that during the preceding year 200 pits had been dug by natives, who appeared to be well satisfied with the proceeds of their labours. It was not until January, however, that the miners really got into full swing. The licences taken out yielded half a lakh of revenue to Government in the six months, a very handsome sum. The tract is controlled by a post of military police at Nanyaseik, and the supervision of the mines is entrusted to a police inspector. There is one drawback; this is the heavy taxation of the district for several months of the rainy season, but Shans and Kachins are believed to be so addicted to opium that they can defy the local fever. The jade mines at Lamun, and miners there are likely to flock to Nanyaseik if the new find of rubies takes place.

## MINING IN THE UNITED STATES.

**The Mariposa grant.—A caution to British investors.—A Nevada placer being prepared for the London Market.—The end of the great Bassick litigation.—The Standard Oil Company acquires mines in Utah.—Rockefeller luck.**

(FROM OUR OWN CORRESPONDENT.)

NEW YORK CITY, OCTOBER 20.

NEWS comes to us from the West that your London Exploration Company is considering the question of making a deal with our Senators, J. P. Jones, J. W. Mackay, and Alvinza Hayward for the purchase of the great Mariposa grant in Mariposa County, California. This is the property I referred to in my letter printed in your issue of August 22 as being estimated to yield its owners some \$500,000,000 in the course of the next few years. Such, at least, was the figure stated by Mr. J. W. Mackay himself in a conversation with my informant. It would now seem questionable whether the profit was expected to come from *bona fide* mining development or from the exploitation of English, French, and German investors. In view of the magnitude of the property, and of the before-mentioned estimate of \$500,000,000 profit being anticipated, a fair inference is that an exceptionally gigantic company is in course of promotion for the European exchanges. Our newspapers here say that the Mariposa grant was offered some months ago to the London Exploration Company, and that Mr. Hamilton Smith, as the expert of such company, is expected to arrive in San Francisco towards the end of the current month, for the purpose of examining the property. It may, therefore, be of interest to many of your readers if I mention some salient facts bearing upon so considerable mining transaction.

The grant consists of 44,380 acres, forming a belt of variable width and of an extreme length of 17 miles from the Merced River on the north to the town of Bridgeport on the south. It was purchased in 1847 by J. C. Fremont from the original Mexican grantee; and, after much litigation and fighting, full title to land and minerals was finally obtained in 1859. Many gold mines were then being worked on the land, and on these being still further developed the output became augmented, until in 1863 it reached the rate of about \$100,000 per month. The estate was then sold to a company incorporated in New York, and a glowing prospectus was issued, accompanied by favourable reports from many experts of good standing. The capital was \$10,000,000, and the stock was issued subject to a debt of \$15,000,000 existing as a mortgage on the property. This was supposed to be the only encumbrance, but when the company took possession it was discovered that other liens existed to the extent of about \$1,000,000. It was also found that the production fell off very greatly after the sale. In 1864 the total yield was only \$465,000, while the current expenditure at the several mines and mills amounted to \$780,000. In 1867 the company passed into the hands of a receiver, and from that time to the present no work of any consequence has been done. The estate is unquestionably of great value, and amongst other features includes a continuous section of about 10 miles along the famous Mother lode. If a very large capital be provided and intelligently expended in opening up the various gold veins on the property a highly profitable result will assuredly follow. The facts of the case and the conditions of success are now practically the same as they were in May, 1864, when the late Professor Silliman made a report on the property from which I think it may be useful to make the following quotation:—

"A person accustomed to view mines must be deeply impressed on the first view of this estate, not more with the great extent and vigour of the former workings—evidence of which is seen equally in the underground extraction and in the surface works, railroads, mills, trails, wagon roads, warehouses, and workshops—than with the equally conspicuous fact that the former owners had no regard for their successors, inasmuch as they have in every instance violated in the most remarkable manner that fundamental maxim of all successful mining—namely, to keep works of exploration well in advance of works of extraction. The neglect of this maxim in ordinary cases is never of doubtful issue. In your case the result has been peculiarly unfortunate, since your estate is not a mine, but a vast collection of mineral veins, of many of which valuable mines may be developed, and on some of which such developments were made of an encouraging character, but the neglect to apply the principle in question has resulted in the complete suspension of three of the mills, the partial suspension of a fourth, and the supply of the fifth for a time with an inferior quality of ore, all because the veins on which these mills depended for ore were worked on the improvident plan of taking all the ore in sight, as far and as fast as it could be found, but never anticipating the evil day, sinking shafts and driving levels long enough in advance of the walls of the present hour to foresee disaster, much less to prevent it. A mine is a storehouse in which are garnered certain treasures of large, it may be, but not inexhaustible supply. Certain it is, the ore which has been mined will never recur. Hence is the fate of all mines at some period to become exhausted. The only compensation to this circumstance is in the possession by one company of a considerable number of mines which may be brought, in succession, into activity, so as to supplement each other. Your position in this respect is one of immense strength; not only do you hold on the Mariposa estate a vast plexus of veins, of most of which very little is known at present, but you also own a great length of country on several veins, the character of which is already proved. It follows from this state of facts that with the frugal and timely application of capital, you ought never to be in a position where the partial or complete exhaustion of a particular mine or of several mines should be severely felt on your general production, nor would it be so to-day had it been the interest of those who proceeded you to apply the simple maxim already quoted. But the reckless disregard of this sound principle has resulted not only in a partial suspension of your production of gold—amounting to a serious disappointment of well grounded hopes—but, still worse, in the almost destruction of certain parts of the mine, where the usual piers of vein have been removed for milling, leaving the mines to crush in, endangering not human life only, but the very existence of the mines themselves. . . . It is quite obvious, from the facts and statements already detailed in this report, that you hold an estate of very great value, but also in a great degree undeveloped, and demanding a large amount of active capital for its proper management. That the judicious use of money will be rewarded, and that speedily, by exploring the undeveloped quartz veins of the estate, is too obvious, I trust, after the arguments and facts already set forth, to require further illustration. All explorations will not be fruitful certainly, but those which are so will become so largely remunerative that they will cancel the others. By no other plan can you hope to manage the estate with honour and profit."

It was rather unfortunate for the reputation of the eminent

Professor that he wound up his remarks with the words "Your manager fully appreciates these views, and his plans now in progress of development will not fail to secure the early and permanent prosperity of the Mariposa estate." Still, every candid and well-informed reader will agree with the report, and will admit the Mariposa grant to form a very desirable mining undertaking. It is to be hoped that if it be presented to your public it will be so shaped as to reflect credit upon American mines. Similar land can be purchased in California at from \$10 to \$50 per acre, and if to this general valuation there be added the ordinary market value of undeveloped claims on the Mother lode, we shall have as a reasonable purchase price some such a figure as the following:—

44,380 acres at \$25 ..	\$1,109,500
30 undeveloped claims at \$10,000 ..	300,000
5 mines at \$50,000 ..	250,000

Total .. \$1,659,500

If this be increased to the round figure of \$2,000,000 there should be enough in the deal for promoters and owners combined, and if \$3,000,000 be raised for working capital you would have an issue of \$5,000,000 stock, for which subscriptions might be legitimately asked from your public, it being certain that with good management the company will earn large dividends upon such a capitalisation. If, however, any attempt be made to dazzle your investors with the enormous acreage of the Mariposa grant, and with the statement that upwards of 1000 gold-bearing quartz veins are known to exist on the estate, and if the capitalisation be thereupon "watered" up to 10, 20, or (as some predict) 100 millions, the enterprise will be one that will be advantageously left alone. A comparatively small portion only of the area is capable of development as mines; and past experience has shown that the gold-bearing quartz is not of an average high grade. A large quantity of the rock that was milled in the Pine Tree, Josephine, and other mines that made the Mariposa grant originally famous, is understood to have yielded less than \$3 per ton.

Another enterprise that is said to be in preparation for you is a larger placer mine at Osceola, White Pine County, Nevada. The property has been worked for some 10 years by an American company, which numbers among its principal stockholders many eminent merchants and professional men of this city, including Professor Maynard and Mr. Wheaton B. Kunhardt, who is one of the vice-presidents of the American Institute of Mining Engineers. The fact of such highly respectable gentlemen being the present owners and operators is expected to produce a serious impression upon the minds and pockets of your investors; and much reliance is also placed upon the fact of the property having been originally examined and favourably reported on by the late Professor Newberry, of Columbia College. He estimated the quantity of gravel available as being 150,000,000 cubic yards, and the average gold content as 13 cents per cubic yard. I understand, however, that the ground has hitherto cost 5 cents per yard to work, a figure which, taking into account the probability that the gravel has been attacked at its most favourable point, would indicate very disadvantageous conditions. I also understand that the expenditure of capital has amounted to \$1,250,000, that no dividends have yet been paid, and that a further expenditure of \$200,000 or \$300,000 for water will be necessary in order to make the enterprise profitable. The owners are said to be willing to let your public have this bonanza at the price of \$250,000, and the American promoter in charge of the matter will, it is believed, be content with \$100,000. Further comment is needless.

The mention of Professor Newberry's name reminds me of the subject of the last conversation I ever had with him. We discussed the singular geological and mineralogical facts presented in the famous Bassick Mine in Colorado. An isolated, almost circular, pipe of rich ore rose to surface through an unfissured formation, and was composed of a cemented and solidified mass of fragments and pebbles of gangue and ore, the cementing material being frequently gold, and the pebbles themselves being not seldom coated with the precious metal. It was calculated to make every advocate of the ascension theory quite happy, and to proportionately perplex the lateral secretionist. After yielding several millions, the property became the subject of litigation, and was shut down. For very many years the case has been in the Courts, but at length the end has come. In the United States Circuit Court of Appeals, sitting at St. Paul, Minnesota, a decision has just been handed down by Judge Thayer, in which the persevering claimant, Dennis Ryan, has been declared the owner of the great property. Active operations will doubtless be resumed, and if ever this particular property be offered on the English market it will be well worthy of consideration.

We hear from Salt Lake City that Frank Rockefeller, Secretary Severance, and others of the Standard Oil Company have been acquiring considerable mining interests in Utah. They have bought a group of mines in the Deep Creek district at Clifton, where no properties are now worked unless they produce ore sufficiently rich to bear a wagon haul of 90 miles, that being the distance to the nearest railroad. It may be taken for granted that the Standard Oil people will not be content to pay any such tax, and that their entering into the field means close railroad accommodation at no distant date. In addition to the Deep Creek mines they have also bought the Black Jack and Trail properties at Mammoth. These lie south-east of the Ajax, and are regarded as certain to prove large producers. Some of your readers may, perhaps, remember the Ajax when it used to be known as the Copperopolis, and when it divided upwards of \$1,000,000 among its stockholders. Another rich strike has just been made in some unexplored ground at the 100 feet level. A pay streak, fully 18 inches in width, is showing ore that carries 63 ounces of gold and 92 ounces of silver to the ton. This, coming on the heels of the Standard Oil purchase of the adjacent mines, is causing a fresh crop of stories of the "Rockefeller luck."

**JAPAN'S COAL PRODUCTION.**—According to the *Tokyo Economist*, the production of coal in Japan amounts to about 3,000,000 tons a year, of which one-half is consumed at home, and the remainder is shipped abroad, chiefly to Hong Kong, Shanghai, Chefoo, Newchwang, Singapore, and San Francisco. The exported coal is obtained from Miike and other collieries in Kyushu and also from the collieries of Hokkaido. In Hong Kong, where about 600,000 tons of Japanese coal were imported last year, it is used by steamers and factories. The possible rivals of Japanese coal in Hong Kong are the collieries of Tonquin and Australia, but they need not be regarded with any dread. Cardiff coal, so long as the silver prices of gold does not appreciate, cannot be exported to the East for ordinary use. In Shanghai, Newchwang, and Singapore, Japanese coal is used for steamships, factories, and in the kitchen. In San Francisco it is used for generating gas. The price of the article is a great obstacle to extending its sale in San Francisco, and at present a reduction is out of the question, as ships that would carry coal to San Francisco find it difficult to get a return cargo. Coal mining has made remarkable progress during the last two decades, for whereas the output amounted to only a little over 500,000 tons in 1875, the supply was over 3,307,000 in 1893; the figures for 1894 are not yet obtainable, but those engaged in the business estimate the output at 10 to 20 per cent. higher.

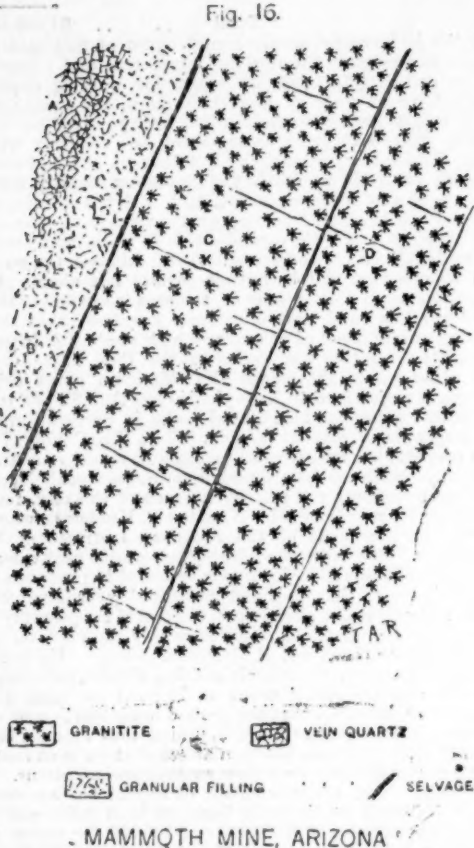


## VEIN WALLS.\*

By T. A. RICKARD, Denver, Colorado.

(Continued from page 1346).

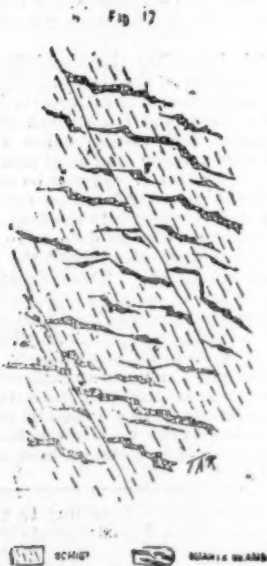
FIG. 16 affords an example of "walls beyond walls." It represents a section obtained at the station on the 500 feet level in the Mammoth Mine, Pinal County, Arizona. The Mammoth lode traverses hornblende granite, porphyry, and a porphyry agglomerate. The lode filling consists of altered country, and therefore changes as the lode in its strike penetrates first one kind of rock and then another. When standing in the stope it is not



MAMMOTH MINE, ARIZONA

difficult to recognise in the ore the reproduction of the habit of either the granite or the porphyry by whose alteration the lode was produced. The country near the lode is much altered and often visibly gradates into the ore, while, as the lode is receded from, these effects diminish until they become confined to the faces of the rock lining the fractures. The granite carries two feldspars, of which the pink orthoclase is evidently more stable and succumbs to decomposition less quickly than the green plagioclase. The ore is both gold and silver-bearing, but chiefly valuable for gold. The great variety of associated minerals includes some uncommon species, such as wulfenite (usually coloured by vanadic acid), vanadinite, desulphurite, ecdemite, dechenite, linarite, besides the commoner anglesite, pyromorphite, cerussite, malachite, diopside, azurite, and a little galena and pyrite. Referring to the drawing (made March 17, 1893), the edge of the ore is shown at A; it becomes mixed with altered granular country (along B) in approaching the "main foot-wall." This is followed by the granite itself, in which there are well-defined walls (or fractures parallel to the lode channel) and cross joints, often lined with exquisite crystals of vanadinite and wulfenite.

Going to the Pacific Coast, Fig. 17 represents a part of the west side of the so-called "Mother lode" of California. The drawing (made May 21, 1891) is a portion of the face of a large open cut at



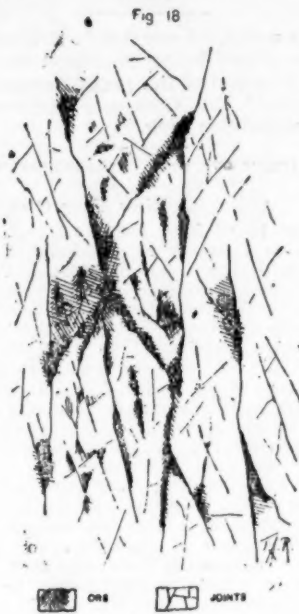
GOLD CLIFF MINE, CALIFORNIA

the Gold Cliff Mine, Angel's Camp, Calaveras County, California, near the now well-known Utica Mine. The ore channel consists of a country rock traversed by cross veins of white gold-bearing quartz. The country rock is a greenish gray argillite schist (probably at one time a diabase), carrying coarse pyrite near the gold quartz.

There are "walls" *ad infinitum*. Each cuts off the quartz seams, which occur again on the further side and extend to the next "wall," where they are terminated as before, and so on. A certain portion, 20 to 30 feet in width, of this channel of country is rich enough to work, and is sent to the mill, but the poorer material which lies beyond it has an identical geological structure. Of course, in such a case the "main walls" will depend for their determination upon commercial rather than geological conditions.

Another case in point is presented at the Cashier Mine, in Summit County, Colorado, as illustrated in Fig. 18, which shows a part of an open cut on the lode, as seen August 22, 1895. The

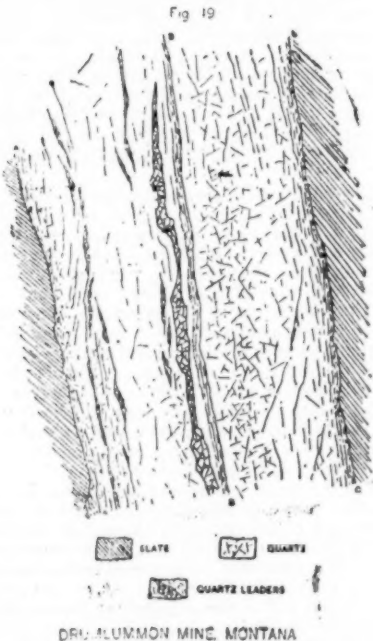
latter consists of altered quartz felsite, rendered porphyritic by



CASHIER MINE, BRECKENRIDGE, COLORADO

large crystals of feldspar. It is spoken of as a vein 45 feet wide, having a hanging wall of porphyry and a footwall of lime. The ore is said to be penetrated by dykes of porphyry. The facts are really these: A certain width of quartz felsite within the neighbourhood of its contact with the limestone has been acted upon by mineral solutions which probably came up along that contact. There are no walls, the porphyry of the hanging being simply the rock of the ore channel in a less altered condition. The feldspar of the lode rock has been leached out. In the cavities, now partially filled with crystalline quartz, iron oxide and gold, there can be distinguished the outlines of the large ( $\frac{1}{2}$  to  $1\frac{1}{2}$  inch) crystals of orthoclase whose removal made the rock porous to circulating waters. The mineralisation is indicated by the softening and reddening of the porphyry, and is most marked along the joints, especially where they intersect. There are occasional portions of the rock comparatively unaffected by the leaching agencies, and, therefore, appearing as hard, unstained nuclei amid a mass of softer reddish ore. It is these that are locally termed "horses" and "dykes" of porphyry.

Lodes subdivided by partings parallel to their outer walls (as in numbers 1, 9, 10, and 12) often resemble twin veins such as are actually formed by the temporary parallelism of two distinct fissures travelling together after they have united. Such a case is shown in Fig. 19, which illustrates the union of the Old and New



DRUMMOND MINE, MONTANA

Castletown veins as seen in the north face of the 500 feet level of the Drummond Mine, Marysville, Montana. The country is clay slate. A B is the Old Castletown vein, 2½ feet wide, B C is the New Castletown, 2 feet wide. There is no selvage on any one of the three walls, but each is marked by soft, crushed, and foliated slate.

(To be continued.)

AS OTHERS SEE US.—It is not often that the editorial wielder of the mighty pen sets out on a tour of exploration in Victoria. Yet, I understand, such has been done within the last few months. It may not be generally known that in London there is an influential paper designated the *London Mining Journal*. In view of the fact that the English market is being inundated with Victorian mines, this enterprising Journal has appointed an agency in Melbourne. The Victorian representative decided to "see for himself," and accordingly fitted himself out with tent and bluey, proceeding from district to district ascertaining the *bona fides* of the various mines. This gentleman visited Yackandandah in common with other districts, and although he passed through the town and visited the various hydraulic mines owned by the Hon. J. A. Wallace, his identity was in no case disclosed. Whilst at Staghorn he tried a prospect in the creek, but was bailed up by the mine manager, who informed him he was trespassing. Of course he passed on, but not until he had asked various questions as to the working of the mine. The *Mining Journal* is to be congratulated on having such an enterprising representative, and the mining industry of Victoria will undoubtedly appreciate the motives that prompted an enquiry into the mining resources of the several districts. English money is naturally jumped at by company promoters, but if the success of Victorian mining is to be assured in the future it is essential that no wild cat schemes be thrust upon the English market. The *Mining Journal* is rightly studying the interests of English speculators in endeavouring to expose any wild cats, and at the same time to laud legitimate concerns.

—Yackandandah Times

## ELECTRICAL PROBLEMS IN MINING.

By Captain C. C. LONGBRIDGE, M.F.I.M.E., M.I.M.E., &amp;c.

## I.—Electric Motive Power.

AMONG the many problems to be solved by the mining engineer is the use of electricity as motive power. The modern mining expert should, therefore, be thoroughly versed at least in the general principles that govern the employment of this force. He ought to know what are its advantages, what are the conditions necessary for its economical use, and what are the data that will enable him to determine, not merely its feasibility, but its commercially successful application. So essential is this knowledge that probably few companies, any standing would now seek reports from an engineer deficient in this qualification, least of all on properties in districts where the conditions of motive power are not fully determined. It needs little reflection to appreciate the advantages that may be derived from the judicious use of electricity for mining purposes. The superiority of this power over steam could be illustrated by a number of examples. Let three typical illustrations suffice. The first instance assumes that either at or within reasonable distance of a mine there is water with sufficient quantity and head for generating purposes. In this case the obvious advantages of electricity over steam would be:—(1) The saving of fuel and of water, which, though used, is not consumed; (2) the use of electric rotary motors, for many purposes superior to reciprocating motion, and generally of greater efficiency than the small steam and compressed air engines attached to hoists, pumps, fans, drills, &c.; (3) the reduction in the cost of attendance and repairs, which are usually less than in the use of steam or compressed air engines; (4) avoidance of loss by steam condensation or air leakage; (5) the absence of mine heating, air vitiation, and rotting of timbers by the discharge of steam underground; (6) the substitution of wires for steam and air pipes; (7) an easy and efficient system of lighting and hauling; (8) the use of a power that can be employed at altitudes where compressed air would be extremely wasteful; (9) a power installation of lower capacity, resulting in a decrease of cost of horse power per annum. In the case of steam power plant for intermittent work as in mining, it is evident that the plant must be sufficiently large to meet the maximum power requirements when all the machines are simultaneously in use, consequently there is for a considerable portion of the time waste of power and of capital unemployed whenever certain portions of the plant are not at work. In the case of electricity, on the other hand, it is possible to lay down a generating plant of less capacity than the maximum power requirements demand, and by running this at all times at full load and, therefore, with maximum efficiency to store surplus power in secondary batteries, which can be drawn upon to supply the deficiency whenever the entire machinery is in use, or to yield temporary motive power in the case of a breakdown. This is of the more practical importance, as storage batteries can now be had to deliver a current efficiency of 94 per cent, or a total energy of about 87 per cent of the power supplied. The second illustration supposes that, at some distance from a mine, fuel and water are cheaper and more abundant, though the water, it is assumed in this case, has not sufficient head or fall to be utilized for generating purposes. In this instance electricity might be generated by steam and then transmitted to the mine. The advantages thus procured would be:—(a) The saving resulting from the difference in the cost of fuel and water at the spot where the power is generated and that where, after transmission, it is used; (b) if the conditions of transport admit of the carriage and erection, the economy effected by the use of a large compound and condensing engine, in lieu of the small engines comprising the several units of a mining plant; (c) the further advantages enumerated above in 1, 2, 3, 4, 5, 6, 7, 8. The third example is that in which electricity is generated at a mine by steam power. In this case the advantage stated in (a) disappears; but those stated in (b) and (c) remain, and might turn the scale in favour of adopting a power more suited to distribution.

It is easy then in the abstract to understand the advantages of electricity as motive power. In concrete cases, however, certain difficulties may arise as to its commercial utility. For there is, unfortunately, a wide difference between the physically possible, and the commercially practical, and the inability of an engineer to rightly discriminate is likely enough to result in heavy financial loss to his employers. One of these difficulties lies in determining whether in any given case generation and transmission will be remunerative. As the cost of transmitted power increases with the distance, it is obvious that, assuming even absolutely free prime power such as free water, at the start, the limit of transmission is reached when the cost of generating and transmitting is on the point of exceeding the entire value of the power delivered. In other words, transmission of power ceases to be commercially practical, when its cost is higher than the difference between the value of the power at the generating station, and that at the point of delivery; or briefly, when the power delivered by transmission is dearer than its equivalent generated at the point of use. In judging of the suitability of electricity to concrete cases, therefore, an actual or working comparison should be made. The institution of such a comparison may be illustrated in the case of the three samples already cited. In the first it was assumed that electricity had to be generated by water power, at or within reasonable distance of the mine. Let, then, (H) represent the capital outlay on the hydraulic plant for driving the generators. (P), the percentage (i.e., rate divided by 100) covering interest, depreciation, and repairs on (H). (E), first cost of the electric plant. (P<sub>2</sub>), percentage for interest, depreciation and repairs on (E). (L), the first cost of the transmission line. (P<sub>3</sub>), percentage for interest, depreciation, and repairs on (L). (W), the annual charge, if any, for water. (C), a constant for superintendence, wages, stores, &c.; this may be taken the same in the case of steam power, and in equating can be omitted. Thus the annual cost of generating and operating electric power will be:—(HP)<sub>1</sub> + (EP)<sub>2</sub> + (LP)<sub>3</sub> + (W) + (C). To compare this with the annual cost of generating the equivalent power by steam at the mine, let (S) be the outlay on steam power by steam at the mine, let (S)<sub>1</sub> be the outlay on steam plant. (P<sub>1</sub>), the percentage for interest, depreciation, and repairs on (S). (F), the cost of fuel and of water per horse-power hour. (N), the number of horse-power hours the plant is operated. (C), the constant as before for superintendence, wages, stores, &c. Then the annual cost of operating the steam plant is (SP)<sub>1</sub> + (FN) + (C). Now, as already stated, the limit of commercial transmission is reached, when (HP)<sub>1</sub> + (EP)<sub>2</sub> + (LP)<sub>3</sub> + (W) = (SP)<sub>1</sub> + (FN), and by substituting actual figures for the several terms, the comparison can be made, and the result, however, must be used with discretion, for it might frequently happen that the cost of fuel is an ever-increasing item, the price rising as the supply diminishes. In view, therefore, of a near increase in the cost of fuel, it might be advisable to adopt electric power, even though at the outset the annual operating charges exceeded those for steam power. Additional arguments, too, for the use of electricity, even at a higher cost are furnished by the special advantages for mining purposes

\* A Paper read before the American Institute of Mining Engineers.



announced above. To adapt the comparison to the second case, where an account of cheaper and more abundant fuel and water, electricity is supposed to be generated by steam and afterwards transmitted to the mine, it is necessary to introduce the first cost of the steam plant.  $(P_1)$ , the percentage for  $(S_1)$  the first cost of the steam plant.  $(F_1)$ , the cost of fuel and of water per unit of electricity generated at the generating station. Then  $(S_2P_2) + (F_2P_2) + (LP_2) = (S_1P_1) + (F_1P_1)$ . In the third case where it is assumed that electricity is generated by steam at the mine, the equation becomes  $(S_2P_2) + (EP_2) + (F_2P_2) = (S_1P_1) + (FN)$ . Here  $(F_2)$  is the reduced cost of fuel and water due to the use of the larger and more economical steam plant.  $(S_2)$ , in place of the smaller engines grouped under  $(S_1)$ . The method, therefore, of determining whether in any given case the use of electricity is advisable is comparatively simple, provided the operator possess sufficient technical knowledge to estimate for this plant and its working costs.

## MEETINGS OF MINING COMPANIES.

### GOLDEN CLIFFS, LIMITED.

The statutory meeting of the shareholders in the Golden Cliffs (Limited) was held on Monday, at Winchester House, Mr. J. J. Edwards presiding.

The SECRETARY (Mr. James Edwards) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—As you are aware, this is the statutory meeting, which, according to law, has to be held within four months after the incorporation of the company, which, in my judgment, was a wise provision, as it affords opportunity for the directors to come face to face with the shareholders and partners with them in the undertaking, and enables them to make known what they have done, and propose doing for the benefit of all concerned. This company was formed to acquire and work the mining lease No. 4081, being a portion of the property now called Golden Cliffs, formerly known as Lady Brassey, situate 1½ mile south of Mount Margaret Reward Claim Company, in the North Coolgardie gold fields. From the reports of eminent mining engineers who inspected and reported on the properties, we are of opinion that we possess an exceptionally valuable property. We give our reasons for this assumption. First, the abnormal gold-bearing mass of stone, which may be worked by open cuts or adit levels. The amount of stone to be milled is sufficient to supply any number of stamps which may be erected. There is all the water supply which can possibly be required, so that milling can be commenced as soon as the necessary stamps are erected. Owing to the situation of the deposits and its elevation above the lake, there is abundance of ore for many years to come without the necessity of sinking below the surface. The whole of the shares have been allotted. The property has been transferred to the company. After acquiring a valuable property the next important step is to obtain a well qualified and efficient manager. After much thought, your directors determined to offer the management to Mr. Scott, of Messrs. Bowes Scott and Co., as they are of the opinion that there is no one so well qualified to take the management as this gentleman, who had inspected and reported upon the property, and I am pleased to tell you that he has accepted the appointment. This, I am sure you will agree with me, shows his confidence in the property. The standing and respectability of his firm are known, not only in this country, but throughout Western Australia. Acting on his advice, a 20 stamp battery has been purchased and all necessary machinery, which is now on its way from Fremantle to the mine, and we may hear any day of its arrival on the spot; meanwhile, a battery site is being got ready. A water shaft has been sunk. A condenser has been ordered to supply the necessary fresh water, pending the finding of a supply at greater depth. From the knowledge we have of the success that has attended adjoining properties, we may expect to find the ore from 80 to 120 feet. After erecting the battery the stone at grass will be immediately put through. Meanwhile, development is proceeding, but necessarily on a limited scale, as the property is a gold-bearing deposit which has only to be broken up and sent direct to the mill. From recent advices we learn that in sinking for water at the Golden Cliffs a very good reef was struck. The stone carried both coarse and fine gold. The reef has been followed up for about 10 feet; it is 4 feet wide, and shows good gold all through. This fresh discovery is a distinct line of reef to that which was originally discovered on the Cliffs. I am pleased to tell you that we have this morning received from the chief of Messrs. Bowes Scott and Co., who is in charge, a letter dated September 18, as follows:—

"I should advise that the work of excavating the battery site be proceeded with, as there are thousands of tons of gold-bearing ore lying on the surface ready for crushing, sufficient to keep a number of stamps going for years to come." I think you will agree with me that this is most satisfactory information, and is in confirmation of all that was stated in the prospectus. I am pleased to tell you we have Mr. Scott present to-day, and you will, no doubt, like to hear from him all he may have to say, and I will, with your permission, presently call upon him to speak. Altogether, you will agree with me that the prospects of the company are first-rate, and I have every hope that when the directors have the pleasure of again meeting you, we shall not have to tell you of what we propose doing, but that we have done in distribution of dividends. I have nothing further to remark, but will now call upon Mr. Scott to offer any observations he may think well to make. (Applause.)

Mr. SCOTT: The Chairman has already told you almost everything in regard to the property, inasmuch as it is an undeveloped property at the present time. However, I should like to draw your attention to this fact. We have, as the Chairman has said, a very large body of stone, containing practically what is considered a low percentage of gold; but, on the other hand, low grade stone is almost invariably far more profitable in the long run than high grade stone, which contains after all gold in shorts only. The Northern Cross Mines in Western Australia are paying better than the Coolgardie Mines, if you take into consideration the capital invested and the returns, and not the question of what is being paid per ounce or what the result per ton is. In this particular property, as I say, we have apparently a very large body of stone. So far, we have only been able practically to scratch its surface; but it is nearly likely that when we prosecute our work we shall not be rewarded, as we expect to be, by very good results. I may also say we have water there in what may be called abundance for that part of the world; I do not think there is any sort of likelihood of the supply being less than is anticipated—that is to say, sufficient for all our wants. As far as the working of the mine is concerned, it is practically a hill which can be attacked by means of terraces and the stone sent direct to the battery. The cost of working in that particular locality should be relatively low, on account of those conditions. Otherwise, of course, it is a long distance off; but these distances are decreasing every day, owing to better tracks, and the fact that the railway gets nearer and nearer. It is now at Coolgardie, which, as the crowd files, is about 130 miles from your property. The battery in part should be delivered by now; certainly the balance of it ought to be there before many weeks are over, and it is quite true that some of the parts do not arrive with these better outside I should think that in four months' time the battery should be erected. I do not know that I have anything further to add. As I have told you, the property as yet presents merely superficial features, which, however, are very excellent.

This concluded the meeting.

### BARBERTON GOLD FIELDS (SOUTH), LIMITED.

An ordinary general meeting of the shareholders in the Barberton Gold Fields (South), Limited, was held on Tuesday, at the offices, 5 and 6, Great Winchester-street, Mr. T. R. ANCELL presiding.

The SECRETARY (Mr. F. Florence) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—We are pleased to meet you here to-day, in order to inform you on the progress made on our property. You are aware that we own 30 claims in the district of Barberton, near the township of Steynsdorp, and that before the company acquired this property a very considerable sum of money had been expended in development. During the past 12 months the development has been continued, and I am pleased to say with results that are most satisfactory, inasmuch as we have proved that in the properties there are permanent reefs which assay an average of 2 ounces to the ton. We first gave our attention to the Thistle Reef property, which comprises a block of 12 claims, upon which our manager informs us there are four distinct reefs. We gave instructions for a fair sample of this ore to be sent over, and we received a bag, containing about 1 cwt., which from the circulars sent to you on May 7 shows the result of the assays by Messrs. Johnson, Matthey, and Co. and F. Claudet, average about 2 ounces to the ton. We, therefore, came to the conclusion that these claims could be worked with excellent results. The remaining 18 claims we hold—namely, the Dick's Luck Mine—are situated 1 mile from the Thistle Reef. Under the advice of our agent in Barberton (Mr. A. Hiller) we came to the conclusion that it would be advisable to concentrate our working on this portion of your property, not because we were disappointed with the Thistle Reef Mine, but because we had reason to believe that the Dick's Luck claims would prove more valuable, and could be worked at less cost, as they are nearer the Komati River and battery site. I am glad to be in the position to inform you that the results have been so far satisfactory, inasmuch as our manager discovered a "new rich strike," which also shows an average of 2 ounces to the ton. The reef is from 2 feet to 4 feet wide, and our manager informs us that he has traced the outcrop of the reef in these claims for about 1 mile. If you will take into consideration that we can work at a cost of about 5 dwts. per ton, I am sure you will come to the conclusion that here also we have a payable mine. In a circular sent you on August 13, when we gave you the results of the assays of this reef, we mentioned that our manager, Captain A. F. Hodge, was coming over to see us. Captain Hodge has arrived, and the statements made by him to us are very satisfactory and most encouraging. He is a gentleman in whom we have the greatest confidence, as he has lived in Barberton for some years engaged in the mining industry. His report is as follows:—

Dick's Luck Mine.—The mine is situated about 3 miles from the township of Steynsdorp, on the north side of the Komati River, and is distant about 1 mile from the proposed battery site. A good wagon road has been cut from the mine to the mill. The property comprises 18 claims, and is pegged right along the line or course of the reef, which is dipping or underlaying east with the hill. The Dick's Luck Reef is of a very strong, masterly character. The quartz on the property is of a yellow and white colour, changing as it goes down to a dark blue. The reef is opened up on the surface by a series of trenches or prospecting pits, and can be traced for a distance of about 1 mile. I have broken pieces from the outcrop for the whole distance, which, after being pulverised and panned or washed, have shown good prospects of gold. The main shaft is sunk to a depth of 60 feet, where the reef became wider, more regular, and much richer. The shaft is secured by good sets of timber, and has been utilised for hauling purposes, &c. No. 1 level south was driven from the bottom of the main shaft to a distance of 85 feet. Some very good quartz was extracted from this point, panning from 8 to 10 dwts. of gold to the ton of rock. A winze was sunk from the bottom of the No. 1 level south, where the reef seemed to have formed a junction. There is some excellent quartz in this winze, a lot of which I have stopped out, the reef being from 2 feet to 4 feet wide, showing a lot of visible gold, and panning from 8 to 10 dwts. No. 2 level south, driven from the bottom of the winze, shows the reef to be well defined, with splendid foot and hanging walls, composed of a species of sandstone and schist, running very regular, keeping a course almost direct north and south. Reef 2 is 2 feet wide. I have stopped a considerable quantity of good pay rock from the back or roof of said level for about 40 feet high, which was hauled to the surface and dumped ready to be taken to the mill. No. 1 level north is in a total distance of 81 feet. The formation at this point is rather broken up, thus causing the reef to be rather disordered, but I have every reason to think that with a few feet further driving ahead the country would become more settled and the reef more fully defined. No. 2 level north is driven from the bottom of the No. 1 winze, and shows a splendid looking level, which pans well. The drive is only in a distance of 10 feet, so there is not much to report on. New rich strike. A trial shaft is sunk a distance of 12 feet, the reef being fully 2 feet 6 inches to 3 feet wide and running parallel with the Dick's Luck reef. The reef keeps the same width from the top to the present bottom of shaft, and has shown some splendid visible gold. I have stopped away the lode east and west from this shaft so that I should have as much of this excellent quartz at grass as possible. Pannings taken daily by myself gave from 10 to 15 dwts. of gold to the ton. I sent a large sample to London for assay, and the results were very satisfactory, giving over 2 ounces to the ton. There is a large quantity of this ore, and with a little development there could be from 200 to 350 tons of this quartz extracted monthly besides what could be stopped from the other points referred to. I should estimate there to be at least 400 tons of good pay rock at grass ready for the mill. I should advise you to lay down a 10 stamp Sandycroft battery, which would crush about 500 tons of quartz monthly. Calculating this ore to yield 10 dwts. to the ton over the plates, this would give 250 ounces of gold, worth at £3 10s. per ounce £75 per month. The whole cost of mining, transport, milling, management, all included, would not be over 5 dwts. per ton, that on a 10 stamp battery working night and day would mean a clear profit of 5 dwts. or £127 10s. per month. I have taken my calculation on a low basis, as I prefer to be under rather than over. I should strongly advise you to purchase a cyanide plant for the treatment of your tailings, which are full of iron pyrites; and judging from the assay results heretofore mentioned, there must be a large percentage of rusty gold, which cannot be obtained by the simple plate amalgamation, and which the cyanide process would extract, thus increasing our return considerably. There could be a splendid tram line laid down from the mine right to the battery site at a small cost, as it is an easy gradient all the way. This is undoubtedly the best and cheapest method of transporting your quartz to the mill. There is an inexhaustible supply of water for all milling purposes and to drive any number of stamps. The watercourse was nearly completed by the New Scotland Syndicate, but has been left idle for a long time, and has partly become silted up. This, however, could easily be remedied. It has recently been surveyed, and is all ready to go on with. There is a large amount of timber close to your property suitable for mining purposes which can be cut down and brought to the mine in wagons or Scotch carts at a small cost. Having worked on the property for a good time, I know it thoroughly, and have no hesitation in saying that you have a genuine property, and with judicious and economical management it cannot fail to turn out splendidly.

I think you will consider that report very satisfactory. The next very important point to consider is the question of machinery. Captain Hodge estimates that we can equip this mine, including tramway and the completion of the water race, at a cost of about £3000, and he tells us that from the present development of the Dick's Luck Mine alone, he could, at any rate, raise 500 tons of ore per month, which would run to at least 12 or 13 dwts. over the plates; in addition to this he expects to get 6 or 7 dwts. from the tailings. You will notice that in his report he has based his calculation of profit on 10 dwts. only. We are now making arrangements for providing the necessary working capital for the thorough equipment of the mine, and for this purpose we have a sufficient number of shares under arrangement to produce £12,000, which should be more than ample for working both the properties, considering what has already been expended, but for the present we propose only to work the Dick's Luck claims, and for this purpose from £3000 to £4000 would be sufficient. I wish to draw your attention to the progress being made in the Barberton district. My information from reliable sources, mining engineers and others, who know the district well, is that mining properties of value are being bought up by several of the most noted Transvaal financiers. You are aware that it was in Barberton that gold in the Transvaal was first discovered. What has kept Barberton back in the past has been the difficulties of transport, but now that the railway has been opened up to the township these difficulties have been overcome, and Barberton will assuredly become one of the principal mining centres in the Transvaal. Many investors have an idea that good and payable mines are only to be found on the Rand. The Rand has hitherto been fashionable, and deservedly so, but in the near future the mines in the Lydenburg and Barberton districts will prove to be equally as valuable, if not more so, than the Rand. (Hear, hear.) Had it not been for the foolhardy and wicked raid made by Dr. Jameson, sup-

ported by certain scheming Rand financiers, whose object appears to have been to seize the Transvaal for their own ends, and by so doing increase their already large fortunes made out of the country, we, like many other Transvaal companies, should have been by this time in a very much better position, and yet we are asked to glorify Dr. Jameson and his crew. For what? For having been the cause of many hundreds of people being slaughtered, including some of our best pioneers who could ill be spared; for having cost the European investors in the Transvaal a loss of something like £100,000,000, and for bringing desolation and ruin on thousands of families, to say nothing of the progress of the country being very considerably retarded. I regret to say we are not in the position to place before you a balance sheet to-day, owing to the fact that we are waiting for the accounts from our Barberton agent, which we are daily expecting, and which should have been received before. Upon the receipt of same, a balance-sheet will be prepared and forwarded to you, when we think another meeting should be held to confirm same. By that time I trust we shall be able to announce to you the completion of the necessary financial arrangements.

Mr. Knopwood, the retiring director, was reappointed, and a vote of thanks was passed to the Chairman, who, in reply, said he had purchased over 9000 shares, and should not have invested so large a sum in the company unless he had faith in the value of the property. The meeting then terminated.

### CHARTERS TOWERS CONSOLIDATED GOLD MINES, LIMITED.

The first annual general meeting of the shareholders in the Charters Towers Consolidated Gold Mines (Limited) was held on Thursday, at the Cannon-street Hotel, Mr. R. J. PRICE, M.P., presiding.

The SECRETARY (Mr. William Vincent) read the notice convening the meeting.

The CHAIRMAN said: Ladies and Gentlemen—The report which the directors have issued to you is a fairly full one, and puts the shareholders in possession of the most material facts—though not all the material facts—which they will have to consider with reference to their property. You will remember that the chief inducement to shareholders to come into the company was the fact that some veins of known richness were stated to be save to traverse the property, and the work that has been done up till now has been the making of a substantial shaft, and the continuing of a tunnel which had already been commenced, with a view of arriving on these well-known veins, developing on them, and working them in a proper and scientific manner. You will all remember that one of the great indications we had as to the value of the property was the fact that at a very considerable depth in the property of a neighbouring company—the Mosman—the North Australian reef, one of the best reefs in the Charters Towers district, had been worked right up to our boundary. We told you at the statutory meeting that we were trying to get leave to make use of the Mosman shaft, and we hoped we should succeed. Mr. Cavey, in particular, was very sanguine about being able to make comparatively early returns to the shareholders from this ready-made shaft of the Mosman Company, but, as a matter of fact, we were a considerable time before we got reasonable access through the shaft. We probably could have at an early date got reasonable but not business-like terms, the truth being that it was not really abandoned, because there were a number of tributaries working there on sundry patches of ore. Consequently the company was not willing to give us access on terms which would have been of any use to us. We have, however, recently got possession of the shaft, and in addition the new shaft, which we had always intended sinking in the centre of the property, has now got down in all probability to the North Australian lode. In addition to that, of course, other patches of ore had been cut in the tunnel, and also in the new shaft, and although we are not in a position to say at the present moment that we have a developed mine, still we have a mine which shows that there is a considerable amount of gold-bearing ground in it, and that it only requires a comparatively small amount of extra work to make it a proper and regular ore-producing mine. The managing director, you will notice, says in his report that the main shaft is down 255 feet, but, as a matter of fact, the present depth is 363 feet, so that you see a very considerable amount of work has been done in that direction. At the same time the tunnel has been extended to 480 feet, and has come to the three lodes which it was anticipated would be cut here. Although we never expected to get the best ore in the tunnel, still I believe the ore bodies which we have cut there—and, of course, tunnelling is a very much cheaper method of mining than sinking shafts—will add materially to the ore reserves of the company. Well, Mr. Cavey's report is before you, and I have no doubt you have studied it. You have also seen the more recent news in which Mr. Cavey refers to a neighbouring company, whose property is on our borders, and where a very excellent discovery has been made. I was sorry to see at the meeting of the New Charters Towers Gold Mine this morning that a good many of the shareholders considered Mr. Cavey almost too sanguine to be entirely reliable, and therefore it is with great pleasure that I am able to read you a letter from our other local director, Mr. Paull, who is well known to be a cautious and able man. He bears out Mr. Cavey's statement entirely. The letter reads:—

"Since writing to you on the 5th I am in receipt of a copy of your letter to the local board, dated July 31, 1896. After writing you I discovered that I had omitted to mention anything about Smith's Extended, which was really the principal thing I had intended to refer to. At the south-western corner of your ground two parties of men are working a new reef in virgin ground. The Moonstone Extended adjoins your boundary. From this claim 130 tons have been crushed in two or three parcels. The lowest yield was 2 ounces, and the highest 3½ ounces per ton. Smith's Extended adjoins the Moonstone Extended, and the first crushing of 62 tons from this claim yielded 642 ounces of gold, worth over £3 10s. an ounce, or averaging 10 ounces 7 dwts. per ton. This crushing came from about 500 feet from your boundary, but the strike of the reef being nearly east and west, the eastern extension would bring the vein into your lease. The Moonstone Extended shaft is about 400 feet from your boundary. I mention this letter because it is a new indication of the value of the property. We knew we were going to have the North Australian and the North Australian P.C., and two or three other reefs hardly worth mentioning by name, but well known for their excellence. However, this is the first time we have heard that these two other reefs, undoubtedly rich in value, are going to run into our ground. Mr. Paull, who is an able and cautious man, writes this letter, and I think you may take it that he would not write as he does unless he himself thinks it is reasonably certain that we may expect to find these valuable veins going through our ground. The worst part of the business is that the reefs are narrow, if you notice; they run for about 18 inches, and others are a foot or so, but if you could get out of them 3 ounce stone, they would still be a very remunerative proposition. As to the position of this company, it is somewhat different to the position of the company, the shareholders of which I had the honour of addressing this morning, because a larger provision was made for working capital. The amount is £20,000, and of that I calculate you have spent between £6000 and £7000, consequently you have between £13,000 and £14,000 left, and I anticipate—and Mr. Cavey evidently agrees with me—that that will be enough to prove the property, provide the machinery, and work the reserves in a proper and miner-like way. Turning to the balance-sheet, you will see on the debtor side that the capital of the company is 300,000 shares, which are all issued, 80,000 fully paid, and the rest with 7s. 6d. credited as paid up, and the other 1s. 6d. has been called up. The 80,000 shares have not been all given to the vendors. When last we had the pleasure of meeting you, I told the shareholders that we were holding back 40,000 shares as some guarantee that Mr. Cavey's report, which we recognised as a vendor's report, and which had not been



formally confirmed, should turn out to be correct. Mr. Cavey was not to receive these shares until the directors were satisfied that his report had been proved to be materially correct. Well, when we came a little later on to spend a great deal of money, we found we had not got a safe title to the property unless we satisfied various shareholders in the old company, and who lived in Queensland, they were entitled to a sum of money, or, in other words, had a legal claim against the property, and we, therefore, thinking it best to make sure of the title, sent over sufficient shares to satisfy their demands. Since then we have received a cable, saying that the title is now perfectly in order, and correct. Looking at the credit side of the balance-sheet, the salaries and wages—£2687—include the salaries of the managing director, the other local director, and their office expenses. Mr. Cavey gets £300 a year, and Mr. Paul £100, but Mr. Cavey supplies the offices. Under this arrangement we have not got an expensive general manager, but only an underground manager. It may be, of course, that when we get the mill erected, and work on a larger scale, that we shall require a more expensive man. As to the London expenses which you will remember are for 15 months, they include directors' fees £1250, and salaries and office expenses £350 a year, for which the secretary supplies the office and the clerical staff. At the commencement of our career the transfer business was very heavy. As to the directors' fees, I want to say that we quite appreciate the fact that we have not got on as fast as we might have done, and knowing that the working capital will, in all probability, be all required, we have decided to adopt exactly the same method of proceeding as was proposed at the New Charters Towers meeting—namely, that we agree from September 30 last to only draw half the fees to which we are entitled. (Applause.) I do not think I have anything more to say to you, because the report really gives you all the information which is really required; at the same time, if any gentleman has any question to ask I shall be pleased if it is in my power to answer him. I now beg to move:—"That the report of the directors and the accounts be received and adopted."

Mr. G. D. JENNINGS seconded the motion. In the course of the subsequent discussion, the CHAIRMAN said the directors would agree to reduce their fees by one-half, or from June 30 last instead of September 30.

The resolution was carried *nem. con.* Messrs. R. J. Price, M.P., and D. MacDonald were re-elected the directors, as also were the auditors, Messrs. Ford, Rhodes, and Ford, and the meeting concluded with a vote of thanks to the Chairman.

### NEW CHARTERS TOWERS GOLD MINES (LIMITED):

The first annual meeting of the shareholders in the New Charters Towers Gold Mines (Limited) was held at the Cannon-street Hotel on Thursday, Mr. ROBERT J. PRICE, M.P. (the Chairman of the company), presiding.

The SECRETARY read the notice calling the meeting.

The CHAIRMAN said that the report now presented brought matters nearly up to date, and gave a fair account of the present position of the mine. The directors expressed considerable satisfaction at this, because although there had been delays, and although obstacles had been encountered of which they had no expectation, the results of the exploratory work had been to show that the company possessed a good mine, which was the most essential feature in any mining operations. (Applause.) The cause of the delay had been the immense quantity of water found in the mine. The old shaft was found to be so full of water that it was impossible to work it, therefore they had to do what would have been necessary in any case—to sink a proper vertical shaft, tapping the lode at depth. That they at once commenced; it was sunk in the right place and in the right manner, and it would be a good and permanent shaft. At 202 feet from the surface, instead of at 160 feet as they anticipated, the lode was struck, which the report and assays showed contained very valuable ore. The ore was not of a uniform quality, and Mr. Paul, in whom they had the greatest confidence, wrote that they must expect to find it somewhat mixed. They knew, however, that in the old workings in precisely similar ore the average was of good quality. The workers of the mine in the first instance made profits for a good many years, but ultimately ceased to carry on the business, so that the mine came into the possession of the company at a very reasonable price. The reason the first workers did not succeed in permanently establishing it as a great mine was that they were unable off the plates to treat the pyritic ore found in the mine. According to Mr. Cavey's latest cable, and if the averages were properly taken as they ought to be, he put it at 2 ounces 11 dwts. If then they could extract a proper percentage of that, which the old workers never succeeded in doing, the company ought to have a very valuable mine, which would repay them for the anxiety and delay which the presence of water in the shaft had caused. Some of the shareholders seemed to be of opinion that they had been a long time about the business, and that the proper machinery should all have been up by now. The reason was that the board did not know the exact form that the machinery should take, and it would have been very foolish to have invested in expensive machinery and cyaniding plant before they really knew the best form which that machinery should take. They wished to ascertain what should be done by conclusive experiments from the lower workings, and Mr. Cavey would send 100 tons of the ore when he got it out. It was intended to have that fresh ore treated so that they might know whether they could do so by wet crushing and still treat it successfully by cyaniding. The wet crushing process was far more reliable, and did a larger quantity than any dry crushing process. The latter was still in its infancy, and could hardly be said to have proved a permanent commercial success. When the board knew the result of the trials, they would at once proceed with the greatest rapidity to put up efficient and, at the same time, as economical apparatus as they could. This property did not require the large expenditure of money that some mines in Western Australia and Africa seemed to need. They possessed very efficient hoisting machinery and engine, which they had obtained at a very low cost, and Mr. Cavey was in hopes of being able to obtain crushing machinery at a reasonable price. Since Mr. Cavey's report, the board had received further information, and the latest advice were couched in very hopeful terms. He (the Chairman) believed the company possessed a very good mine, and in a fair state of development. The question then arose as to whether they had sufficient money to carry out the original programme. Mr. Cavey originally estimated that the entire cost before the property became remunerative would be £5000. He (the speaker) had always added something to that in his own mind, as he knew that estimates were generally exceeded. They had, therefore, been prepared for this by making the working capital of the company £13,000, instead of the £5000 at first supposed to be sufficient. The cost of sinking the shaft under the circumstances had been very much higher than was anticipated. It had been thought that in opening up the mine they would be down to payable stone in the course of four or five months, but instead of that it had been eighteen or nineteen, and, of course, the expenditure had gone on regularly. In sinking that shaft, perhaps, some of the shareholders might think it remarkable

that the water was not dealt with by a steam pump, but Mr. Cavey and Mr. Paul had come to the conclusion that it would not be practicable to go on sinking the shaft with a steam pump going, and, therefore, they were obliged to use the more primitive appliances of hand pumps and baling, which made the work exceedingly slow. They had still out of the £13,000 working capital with which they originally started something between £5000 and £6000, and from the price of machinery over there they ought to be in a position to put up efficient crushing and cyanide plant at a comparatively low price. He then proceeded to explain the accounts in detail, explaining that they extended over a period of 16 months, and not 12, as he believed some shareholders were under the impression. As to the directors' fees, they amounted to £750 a year, but when the last quarter came to an end the directors, considering the financial position of the company, had agreed to take only half their fees until the company was in a dividend-paying condition, and he concluded by moving the adoption of the reports and accounts.

Mr. JENNINGS seconded the motion.

Mr. ROBERT BUTCHER thought the hopes held out to the shareholders regarding the property had not been realised in the slightest degree. The result of matters had ended in their shares standing at 9d. each; indeed, the only people who could be congratulated were the directors, who derived very handsome fees. He would move as an amendment to the motion—"That the report and balance-sheet be not adopted."

Mr. WAINWRIGHT seconded the amendment.

Mr. STEWART thought that this company and the Charters Towers Consolidated should be worked together, under one board and one management, so as to save working expenses. From all he could gather, he was of opinion they were in measureable distance of reconstruction, if not of total failure. The best plan, he considered, would be for three or five of the largest shareholders to look into their affairs, and report to an ad hoc committee.

Mr. ISAAC SMITH said the shareholders would not object to the directors being fairly well paid, provided they had a remunerative business. Under the present circumstances, they should give the directors £100 each a year until they were in a position to reward them properly.

Mr. J. H. A. SMITH said that probably it was ungracious to attack the directors on the question of fees, but it was absolutely necessary that the small amount of capital they had left should be carefully administered. They had to put up stamps and cyanide plant, and unless they could provide it out of this capital, they would have the business of reconstruction to face.

The CHAIRMAN, in reply, said that although they had had a hard time, and a low market for their shares, they had still a good property. Out of their present resources he believed they would with economy be able to equip the mine. As to directors' fees, he would agree to an honourable understanding that they should not draw more than £300 a year out of the funds of the company until it was in a dividend position, and that when they reached that point, the shareholders should not grudge them their back fees. (Applause.)

Mr. BUTCHER then withdrew his amendment, and the report was agreed to unanimously.

Mr. R. J. Price, M.P., and Mr. Alfred Jones were reappointed directors, and Messrs. Ford, Rhodes and Ford as auditors. A vote of thanks to the Chairman concluded the meeting.

### SIR WALTER RALEIGH MINING COMPANY, LIMITED.

The second ordinary general meeting of shareholders in this company was held at the registered offices of the company, Throgmorton House, Copthall Avenue, London, E.C., on Thursday last, the Hon. J. H. H. BERRKELEY presiding.

The SECRETARY (Mr. A. C. Adamson) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—As you have had in your hands for some days the audited statement of the accounts and the directors' report, I presume that you will take them as read, but as I am aware that to many shareholders a mere statement of accounts such as is ordinarily shown in a company's balance-sheet does not convey the fullest information, I desire, with your permission, before moving the formal adoption of the accounts and the report, to go through each item of the expenditure, and to offer you some remarks thereon. (The Chairman then went through every item in the accounts and explained them fully.) From the remarks which I have made you will now properly understand our exact position. To summarise it briefly:—Our manager tells us that he will make his first crushing on January 15, and estimates his requirements until he commences crushing at £500 per month. We shall, therefore, have to spend some £1500 more before we get our first crushing, and when that sum has been spent there will still be available for further development of the property some £6000 of our original working capital. I do not, at the present moment, intend to refer to what will be the probable result of our first crushing (I will tell you about that later), I only want you now to bear in mind that after having paid for our property, paid for and erected all our machinery, buildings, and a light tramway of about 6000 feet, and having done a considerable amount of work on our property, we shall have remaining at the day when we begin to get gold by crushing about £6000, and I feel sure you will all consider that very satisfactory. So far I have dealt entirely with what I may call the purely financial aspect of the subject. To turn now to the general position. First of all, I will remind you that our property consists of 14 claims, comprising a little over 243 acres on the Barima River, in the north-west district of British Guiana. For this property we hold a grant in perpetuity, dated September 15, 1895, direct from the Government, and you will know this is a very different thing from an ordinary mining lease. Immediately we received intimation that this grant had been given us, we ordered all our machinery, which comprises a battery of 20 stamps of 850 lbs. each, and winding and pumping gear, together with a tramway and all the necessary appliances, and it reached Georgetown at the end of last year. Unfortunately, there occurred in British Guiana at the period of the arrival of our machinery a drought such as has not been known for the last 30 years, and the Barima River, which is generally navigable for vessels of at least 12 feet draught, became quite unnavigable, and it was only some time in August that the first portion of the machinery reached the mine, the whole of it not being delivered there till September. From that date every effort has been made to get the erection of the machinery completed, and our manager was directed to let every other work be made subservient to this purpose. He is using every effort, and he informs us, as I have already said, that he will make his first crushing on January 15. The engine house, buildings, men's houses, and manager's house had all been completed, and the tramway laid down from our landing stage on the river direct to the mill site, pending the arrival of the machinery, and as much development work at the mine has been done as possible. You may remember that in the prospectus we were informed that there were three reefs which had been proved on the property, and we were recommended by Mr. Sweet, our then manager, that our first work should be to put down shafts on the reef known as the D'Abra, and also on what is known as Owen's, or the flat reef. On both of these reefs shafts have been sunk to water level, and until the erection of the machinery is completed we cannot do much further work on them. As far as we have gone down on them the indications are that they are both good reefs, especially the D'Abra, and as soon as the pumps are erected we shall go down steadily on

them with every reasonable hope of their continuing as good, and, indeed, improving, as we get deeper. The ore available to a depth of 30 feet on the D'Abra and 95 feet Owen's reefs has been estimated by Mr. Sweet at 25,500 tons. On these reefs work will be continuously proceeded with, and although, owing to the delay in the erection of the machinery, we have not got a large amount of ore from those reefs yet at grass, there need be no anxiety as to our being able to keep the mill fully employed when the vast amount of float quartz which is distributed over almost the whole of it. This float quartz is disintegrated quartz, which is distributed all over the claims, but is found more plentifully in the creeks and gullies. It lies under a deposit of about 18 inches of alluvial matter, and has only to be collected and placed on the dump near the mill. There is no cost for mining, sinking, or tunnelling for it. It was estimated in the prospectus that there was at least 40,000 tons of this float quartz which could be collected and milled at a cost not exceeding 8s. 6d. per ton, and after being on the mine some time, and having ample opportunities for further determining its nature and extent, Mr. Sweet wrote us:—"Float quartz. Every minute I can spare devote to testing this mineral. From many examinations made since my arrival here I am more than ever convinced of its value, and as to its having been under-estimated rather than over-estimated in the prospectus." And he further wrote us on March 15:—"Float quartz. There will be no difficulty to keep the mill supplied when once the rails are laid. We have so many different places to draw from, extending from the very spot where the mill is to go up to the furthestmost part of the property, that our resources will be practically illimitable." And Mr. Settle, our present manager, has since confirmed the fact that there is a vast number of tons of float quartz and gravel to be milled. Of the value of this float quartz it may not be uninteresting to you to learn the opinion of Mr. C. E. Clarke, an eminent American mining engineer, as given in the *Engineering and Mining Journal* of July 11, 1896. He was sent out by a firm of wealthy American capitalists to ward of our holdings. Of the float quartz on this block he says:—"One side of the hill I found packed to the top with small broken free milling quartz; I have had this frequently tested and the average ran over 9s. to the ton." In our prospectus it was estimated that the float rock only gave us 5 dwts. to the ton (which is just about half what Mr. Clarke estimates it at) we should on treating 15,000 tons make a profit of over £9000 a year from it alone. Since the estimates for our mine were made, and since Mr. Clarke wrote his report, a practical test on a considerable scale has been made of the value of this float quartz on the Barima Gold Mining Company's property, distant about 4 miles to the west of ours. We understand that a large quantity of this float quartz and gravel similar to what is on our mine has been put through their mill with most satisfactory results, as you will know from the fact that a total of 3139 tons, including this float quartz, has yielded just about an ounce to the ton, and we are informed by those who were on the spot at the time when some of the crushings were made that the float quartz averages considerably over half an ounce to the ton. In about two months from date of their first starting to crush they have won some 3134 ounces of gold of the approximate value of about £12,000, on which there must be a very large profit. Our first manager was Mr. Sweet, who came to us with good recommendations. He stayed with us until some time in March last, when he left the colony informing us that he was suffering from insomnia and nervous debility. On his arrival in England he expressed himself more than ever satisfied with the value of our property, and told us he intended to return almost immediately, but afterwards he did not do so, and we had to get another manager. On Mr. Sweet's departure we were able to obtain the services of Mr. J. F. Connolly, the mining and consulting engineer of the British Guiana Prospecting and General Development Company (Limited), who was on the spot, and Mr. Connolly did some most excellent work on our property. Mr. Connolly, gentlemen, is one of those who reported upon and assisted in laying out the Barima Gold Mining Company, and he also laid out our property. His was one of the reports given with our prospectus. He had been in British Guiana since November, 1895, until a few weeks ago, when he returned to England; he is here to-day, and he will no doubt tell you something about our mine himself. I wish to say one thing in connection with him. In his report (which I have seen) on the Barima Gold Mining Company, he estimated that mine as likely to give about 15 dwts. to the ton. It has turned out to be worth very considerably more. We have, therefore, the satisfaction of knowing that he is a man who does not probably over-estimate the value of a mine. When we learned that Mr. Sweet did not intend to return we advertised for a new mining manager, and selected Mr. J. B. Settle, who was formerly general manager of the Transvaal Albion Gold Mining Company. He has had considerable experience of quartz mining, and was highly recommended to the company. He went out in June, and after a very exhaustive examination of our property he reported July 30:—"The mine has a great future before it, there are two good reefs already proved, and a large number of tons of float rock and immense alluvial deposits which can be put through the mill." Writing again to us on September 20, he said:—"I tapped the D'Abra reef in one place, giving a good 2 ounces to the ton, and carrying visible gold. I am going to follow this up as far as practicable. I have dumped 250 tons of loose gravel all yielding a good 1 ounce to the ton and have another 250 tons equally good if not better." And in a letter which I only received this morning from Mr. Settle, he writes:—"The Barima have had another good return—about an ounce to the ton. I hope to have crushings as good as any of them." When Mr. Settle wrote this he was well aware that the first crushing of the Barima gave 769 ounces from 459 tons. Therefore, I think we may be certain that our first crushing will be a satisfactory one, and that we shall have plenty of good stuff to put through the mill and keep it fully employed. Remember, gentlemen, that we are not relying on estimates only. We have had a good practical test, for some 50 tons of stuff have already been put through a mill, and yielded 2 ounces to the ton. We may, therefore, assume that our mill will be kept supplied with stuff that should give us at least an ounce per ton. In these days we read frequently of phenomenal number of ounces per ton as having been obtained from some of the West Australian mines, and you may think an ounce per ton not much, but we shall be amply satisfied with such a return. It is estimated that the cost of all our mining, milling, and general expenses will not exceed 25s. per ton; it is more than possible it will be less. Labor is cheap and plentiful, water abundant, and of fuel we have a supply which will certainly last us 20 years, and will cost us less than coal at 10s. per ton. You will, therefore, see that we ought to be able to work cheaply, and our property should be—what the *Engineering and Mining Journal* of New York prophesies it will be—"a big dividend-paying concern." Gentlemen, let me also remind you that our work up to the present has been almost entirely confined to four blocks (Nos. 6, 8, 9, 10). The other 10 claims are still practically unexploited; very little prospecting has been done on these management property is very large—perhaps too large for one management—and, no doubt, as soon as we get successful crushings from our present workings, we shall make arrangements for the formation of two or three other companies to work portions of our claims. Mr. Sweet is very positive that with further prospecting the reefs now being worked by the Barima Gold Mining Company will be found in claims Nos. 1 and 2. His own words are:—"There is no doubt as to the existence of these reefs in the property." We have hitherto had our hands fully employed in the property. We have the Barima crushings have proved the lower down, but now that the Barima crushings have proved the great value of these reefs, we shall now make systematic search for them. I think I have probably said enough to convince you that you have a valuable property, the shares in which are worth holding for the considerable rise that will almost certainly follow the commencement of crushing. The shares of the Barima Gold Mining Company, prior to their crushing, were obtainable at a low price. Immediately after the result of their first crushing was known they went to, and are still at, a considerable premium, and there



I am informed, many more buyers than sellers even at the present very high figure. So I believe it will be a very profitable year for our shares. We are often asked why there is no more activity in our shares. Well, gentlemen, all I can say is, we have no more activity in our shares. We are often asked why there is no more activity in our shares. Well, gentlemen, all I can say is, we have no more activity in our shares. We are often asked why there is no more activity in our shares. Well, gentlemen, all I can say is, we have no more activity in our shares.

Mr. Frost remarked that the expenses of the office were exceedingly reasonable, not to say small.

Mr. Mason asked the width of the two reefs mentioned by the Chairman.

The Chairman said he believed the average width of the D'Abré reef was 2 feet 6 inches, while the Owen reef averaged 2 feet in width.

Mr. Connelly said from personal knowledge of the property, he believed the company had got a bright future. There were several reefs already exploited, and as the Chairman had pointed out, there was a good deal of stuff which would pay to work. Only a small portion of the property had been prospected, and he felt confident that as time went on other reefs would be found. Personally, he had not the slightest doubt that the whole of the Barima series would be found on the property. As the Chairman had pointed out, the property was really too large for one company to work, and he thought it would be advisable to dispose of the south-west block to some other company for exploitation, which would considerably enhance the value of the properties of both companies. Of the value of the Barima series there was not the slightest doubt. He had some of the finest assays and pannings made from various portions of the Barima series. One portion of the latter went 130 ounces to the ton. The Owen reef varied in width from 18 inches to 3 feet. In some places it was 4 feet wide, but the average was 18 inches, and the ore would mill about 2 ounces to the ton. When the property was further opened up, he believed the shareholders would find that they had got one of the finest properties in the north-west district. He might add that two-thirds of what the Barima Gold Mining Company were now crushing was float quartz. They were only getting about one-third of their reef through the mill, so that there could be no doubt as to the value of the quartz. From the Barima River to and beyond the Araka Placer Mining Company's claims, there were millions of tons of float quartz, and the whole of it would pay to mill.

The Chairman asked Mr. Parrar, the original prospector of the Barima Gold Mining Company's claims, and a gentleman who had considerable mining experience both in Alaska and Venezuela, to give his opinion of the property.

Mr. Parrar stated that he also knew the district, and thought the property was very good.

The Chairman then formally moved the adoption of the report and accounts.

Mr. Frost seconded the motion, which was carried unanimously.

The Chairman proposed the confirmation of the appointment of Mr. Edward Walmesley as a director of the company, remarking that that gentleman was a director of several mining companies, and his knowledge of mining was of great benefit to the board.

Mr. T. Newton seconded the motion, which was carried unanimously.

The Auditor, Messrs. Joselyne, Miles, and Blow, having been re-elected, on the motion of the Chairman, seconded by Mr. E. G. Webster, M.P., Mr. Frost proposed a vote of thanks to the Chairman and directors, which was seconded by Mr. Hedges, and carried.

The proceedings then terminated.

**NORMAN PROPRIETARY GOLD MINES, LIMITED.**

The first ordinary statutory general meeting of the shareholders in the Norman Proprietary Gold Mines (Limited) was held at the offices of Chartered Accountants, Moorgate-place, E.C., yesterday, Mr. Edward Lee presiding.

The Secretary (Mr. Arthur Hedden) read the notice convening the meeting.

The Chairman said: Gentlemen—You are called together today in compliance with the requirements of the Companies Acts, to meet at the first ordinary general meeting of the company, or, as it is usually termed, the statutory meeting. The company was registered on July 2 in this year, and on August 31 a prospectus was received by the solicitors from their correspondents in Auckland announcing that the transfer of the property had been duly completed, and that it was registered in the name of the Norman Proprietary Gold Mines (Limited). Your directors immediately proceeded to appoint the members of the advisory board in the colony, consisting of Messrs. W. H. Churton and W. Coleman, both gentlemen of great local influence and experience, and it was on their advice that your board subsequently appointed an experienced acting manager and mining engineer in the person of Mr. William Hollis, whose report on your property appeared in the prospectus, and who has since acquainted the board with the plans he is now adopting for the development of the mine.

These plans are regarded as eminently satisfactory, and we think you are to be congratulated on this appointment, as Mr. Hollis will naturally feel a personal interest in doing everything he can to justify the opinion he has already expressed as to the value and capabilities of the property. A cablegram received from Mr. Churton, dated as recently as September 24, states that the reef at the outcrop assays £1 8s. 6d per ton. This is equivalent to over one-third of an ounce of gold per ton. This may be regarded as a paying result, considering how economically the mine can be worked. Mr. Churton gives it as his opinion that it is not only satisfactory but highly encouraging. Your directors have not yet committed themselves to any outlay for machinery, considering it advisable to wait until further development work has been carried out, and they await with interest the results of the working of a new process of ore reduction (the atomic), which, should it prove successful, they might arrange to adopt on economic grounds. The process is now being put to a test on a large scale, and when the result is known the board will have some guide to go by. We shall adopt the process on purely economical grounds, as it will almost revolutionise the mining industry. It will crush ore—so those interested in the matter must—at a cost of 1s. a ton, whereas with the ordinary stamping process the cost is between £1 and 30s. Therefore, I think it is very desirable to await the result of the experiment. I will now read you a cable which we received only this morning:—“Driven 180 feet; ground is highly mineralised. Appearances in favour of our striking the ore body very soon. Results of assay will follow; have not yet received them. Will be forwarded to-morrow.” The supplementary telegrams we have not yet received, but we hope and believe it will be highly satisfactory. I do not know that I have anything more to say to you, except that I think the prospects of the property seem abundantly satisfactory in every way, and I hope when next we have occasion to call the shareholders together, the anticipations which we now entertain will be realised, and will, I trust, be satisfactory to you all. If there are any questions which any shareholder would like to put, we shall be very glad to answer them.

The questions being asked, the meeting terminated.

**SAN PABLO NITRATE COMPANY (LIMITED).**

The eighth annual general meeting of the shareholders in the San Pablo Nitrate Company (Limited) was held at Winchester House, E.C., on Monday, when Mr. Robert Harvey, who presided, in moving the adoption of the report, said this was the first time the directors had regretted their inability to announce a dividend. Looking over the accounts, however, he found that they had paid up to date £24,000 in dividends, which was two-thirds of the capital of the

company. Although the year's trading had proved unremunerative, they might congratulate themselves on the fact that the balance of profit and loss was on the right side. The account for the year's working showed a debit of £3601, which, deducted from the amount brought forward, left a balance of £770. There had been a loss on trading of £3099, but there were two or three items charged against profit and loss which might reasonably have been extended over a longer period. The exploration of the Santa Rosita grounds had satisfied the directors that they were capable of producing 2,000,000 caliche of nitrate of soda, which should be worth a sum of £50,000. The whole cause of the present state of affairs was the low price of nitrate. The directors had done all in their power, and would refuse to receive anything for their services until a dividend had been paid.—Mr. J. J. Smith seconded the motion, which was carried.

**WAITEKAURI CONSOLIDATED GOLD MINES (LIMITED).**

The statutory meeting of the shareholders in the Waitekauri Consolidated Gold Mines (Limited) was held on Monday, at Winchester House, E.C., when Mr. W. Marshall, who presided, said Mr. Lawson, who had been appointed mine manager, had not yet arrived in New Zealand, and, therefore, the directors had at present very little information about the property. The lease they held was between the two sections of the Waitekauri, which was now so well spoken of. The manager had been instructed to make a thorough inspection of the property, and submit a report as early as possible. Only £10,000 has been subscribed, but they had 30,000 shares in reserve, and their intention was to keep them until the development work had been well advanced. The general opinion in Auckland was that the mine was exceptionally well situated.—A vote of thanks to the Chairman concluded the meeting.

**HAMPTON PLAINS ESTATE (LIMITED).**

An extraordinary general meeting of the shareholders in the Hampton Plains Estate (Limited) was held on Monday, at Winchester House, E.C., Lord Arthur Butler presiding, for the purpose of confirming the resolution passed on October 1, providing for the reduction of the capital by returning to the proprietors 4s. for each share, upon the footing that the sum returned could not be called up again.—The Chairman formally moved the resolution.—Mr. Allan P. Stoneham seconded the motion, and said the work of developing the property was satisfactorily progressing. In less than three weeks three important discoveries had been made on the estate. On Block 53 rich ore had been struck on the 70 feet level, and on Block 42 water had been found at 135 feet. Gold had also been discovered in the drive from the 70 feet level on Block 53.—The resolution was carried, and the meeting concluded with a vote of thanks to the Chairman.

**NEW ZEALAND CROWN MINES (LIMITED).**

The statutory meeting of the shareholders in the New Zealand Crown Mines (Limited) was held on Tuesday, at the Cannon-street Hotel, E.C., Mr. Robert Smith presiding.—The Chairman said that the company had been formed, with a capital of £20,000, to acquire two adjoining properties—the old New Zealand Crown and the Earl of Glasgow Mines. The former mine had paid dividends, and was equipped with plant and reduction works. The other property, it was anticipated, would form a valuable addition. The capacity of the battery on the Crown Mine was being considerably increased, additional water power was being brought in, and a compressor plant had been ordered for internal working. These improvements would enable them to reduce the cost of winning and treating the ore. On October 24 the following cablegram was received:—“There is a great improvement in No. 6 level, south of river, and all other parts of the mine.”—A vote of thanks to the Chairman concluded the meeting.

**WHITEHEAD AND SULTAN GOLD MINING COMPANY (LIMITED).**

A meeting of the shareholders in the Whitehead and Sultan Gold Mining Company (Limited) was held on Tuesday, at the Cannon-street Hotel, E.C., Mr. Robert Smith presiding.—The Chairman said at a meeting held on August 10, the shareholders authorised the directors to look out for another property to take the place of the Whitehead and Sultan Mines, which had, unfortunately, proved so unsuccessful. Recently, the directors, obtained an offer of a mine in New Zealand, and after very careful consideration, they thought the property of such excellent promise that they were unanimously of opinion that the company should acquire the same. The property was situated right in the heart of the Thames gold field of New Zealand, was easily accessible, was in close proximity to a water supply, and comprised in all some 70 odd acres, and, in addition, a valuable freehold battery site, with a 40 head stamp battery now in course of erection, of the most up-to-date standard. The price they had agreed to pay for the property was £6750 in cash and £35,000 in fully paid-up shares of their company. They had, however, stipulated with the vendor, who had agreed to subscribe 5000 shares at par, so that the actual cash the company would be out of pocket over the transaction was £1750. In conclusion, the Chairman expressed full confidence in the property, and moved a resolution approving the purchase of the new mining site in New Zealand.—Mr. Lonsdale seconded the resolution, which was carried.

**HYDERABAD (DECCAN) COMPANY (LIMITED).**

The tenth ordinary general meeting of this company was held on Tuesday, at Winchester House, when the Chairman, Mr. H. Batten, in moving the adoption of the report and accounts, said they would remember that in December, 1894, a resolution was passed to the effect that the capital of the company should be reduced by £30,000 at the cost of the holders of £150,000 deferred shares, in consideration of the remaining £120,000 becoming ordinary shares. This resolution was found to be defective, and it was not until June, 1895, that one of the same effect, but in different form, was presented to the High Court for confirmation. The Court, however, thought it right that notice of the petition should be given to the Government of the Nizam. The legal advisers of His Highness at first raised objections, but these were eventually over-ruled by the High Court here, and judgment given in favour of the petition, which judgment was accepted by the Nizam's Government. The position and progress of their Singareni collieries must be considered very satisfactory, and their chief object was to extend their markets. During the last few months they had booked large orders for coal to be delivered in Bombay, including 50,000 tons for the Bombay, Baroda, and Central India Railway, and up to the 8th inst. 33,000 tons for various spinning, weaving, and manufacturing cotton mills and other industrial works. That the quality of their uncreased coal was appreciated was evident from the fact that they had been for some time supplying all the railways in Southern India. During 1895 their collieries earned a profit of £28,781, from which £5475 was paid to the Government in royalties. With regard to the Wondalli Company the working capital subscribed was £76,352, out of £100,000 offered for subscription, this company having paid all the charges of flotation, and by the close of the year it was expected that the mill would be at work. This company held 150,000 £1 shares in the Wondalli, not included in the balance-sheet, and forming an additional asset, so that when gold was being produced they would have to consider how to deal with it. They were also making arrangements to work the Boodini Block, and the large area of 1000 square miles comprised in the Raichore Doab Gold Lease was being blocked out and examined, but work at other gold mines, as well as diamond prospecting, was for the present suspended. Up to the end of 1895 these amounted to £26,779, of which £31,217 was in the till, the rest having been employed as capital in the business.—Mr. B. W. Colvin seconded the motion, which was carried, and shortly afterwards the proceedings terminated.

**GLOUCESTER GOLD MINING COMPANY (LIMITED).**

The statutory meeting of the shareholders in the Gloucester Gold Mining Company (Limited) was held yesterday at the offices, Throgmorton House, Copthall-avenue, E.C., Major-General de la Fosse presiding.—The Chairman said the company went to allotment about three months ago, and during the time the directors had been in office they had appointed the Hon. W. McCulloch, a member of the Legislative Council, as their agent.

Mr. McCulloch, who was in London a short time ago, expressed himself very favourably in regard to the property. Recently negotiations were entered into for the purchase of two adjoining mines—the Hercules and the Little Willie. The latter had been paid for, but they had received no news with regard to the former. At present no steps had been taken to acquire the necessary machinery as the directors were awaiting reports from the experts engaged to inspect the property.—Subsequently an extraordinary general meeting of the company was held, when a resolution was carried making certain alterations in the Articles of Association in order to comply with the Acts of the New Zealand Legislature.—The meeting concluded with a vote of thanks to the Chairman and directors.

**GOLD REEFS OF WESTERN AUSTRALIA (LIMITED).**

An extraordinary general meeting of the Gold Reefs of Western Australia (Limited) was held, on Thursday, at Winchester House.—Major-General Sir J. W. Campbell presided, and moved a resolution to the effect that Edmund William Dawson, Sir Francis J. Milman, and Major-General Geo. D. D. Wolfe be removed from the directorate, and that the resolution to wind up the company, alleged to have been passed at previous meetings, was not in the interests of the company, and that the directors other than those named be authorised to take steps to prevent such alleged resolution being carried into effect, and to rescind the same.—The Chairman had just begun his speech in support of the resolution, when Captain Dawson rose and said he did not recognise the position of Sir John Campbell, except as the Chairman of an informal meeting.—Eventually the resolution was declared carried by the Chairman, though his decision was disputed by Captain Dawson and Mr. Beverley.

## DIARY.

Monday, November 2.

Standard Oil Company of Galicia, Winchester House, 12.  
Violet Consolidated, 85, Gracechurch Street, 12.30.  
Society of Engineers, Royal United Service Institution, 7.30.

Tuesday, November 3.

La Yasca Gold and Silver, Winchester House, 12.  
Tin Ticketing, Tabb's Hotel, Redruth, 1.

Wednesday, November 4.

Antioquia, 184, Gresham House, 12.  
Holman's Lucky Hill Gold Mine, Winchester House, 12.  
Colar Central Gold, Cannon Street Hotel, 12.  
North Boulder East Block, Winchester House, 12.30.  
New St. Augustine, Cannon Street Hotel, 2.  
Exploration Company, Cannon Street Hotel, 2.30.  
Institute of Secretaries, 2nd Lecture, "Smokeless Powder, &c.," Museum of Practical Geology, 8.

Thursday, November 5.

British Colonial Mining Corporation, Winchester House, 12.  
South Australian Land Mortgage and Agency, Win. House, 12.  
New Queen, Winchester House, 3.

Friday, November 6.

British South Africa Company, Cannon Street Hotel, 12.  
Waitekauri Gold Mining, Cannon Street Hotel, 12.  
White Horse Gold Mining, Cannon Street Hotel, 2.  
West Australian Venture, Winchester House, 3.

## NOTES FROM BRITISH COLUMBIA.

(FROM OUR OWN CORRESPONDENT.)

IN Kootenay at present there are two rival districts courting the favour of the investor. They are 50 miles apart, of totally different character, and both have mineral riches of the best to offer. These are the Slocan and Trail Creek. The Slocan produces silver, Trail Creek gives gold. The latter fact is enough to decide some people in its favour, but there are many points about the Slocan that commend it to others. Taking the output from the mines of both, ton for ton, as it comes out of the shaft or tunnel, Slocan ore is worth slightly over \$100 per ton, and Trail Creek ore something less than \$50. The director of the Provincial Bureau of Mines gives the average value of all the ore hitherto shipped from Trail Creek as \$37.18, its contents being, gold, 1.67 ounces; silver, 2.5 ounces; and copper, 2.3 per cent. The average value of Slocan ore, taken from the Customs returns of 16 different mines shipping ore to the United States, was a little over \$103 per ton. For this purpose the value of silver was taken at 65 cents. From this last calculation some of the richest ore was omitted. For instance, the Good Enough Mine was sending out ore at the time containing 700 ounces of silver to the ton.

The Slocan is eminently a "poor man's" camp, because its ledges crop out on the surface, and the miner can usually get clean galena from the start, which will pay all his expenses of development and put something into his pocket as well. Some of the mines now largely opened up, and producing great quantities of ore, have been brought to that condition by their original locators who were poor men. On the other hand, most of the Trail Creek deposits are overlaid by iron cappings of considerable thickness, and the ore does not obtain a marketable value until depth has been gained.

There is no doubt that Trail Creek offers a valuable field to the investor who has capital behind him in considerable quantities, and it has, in addition, the merit of producing gold instead of silver. But from the Slocan the man of more limited means can probably add as many dollars to his bank account. The uncertainty of the silver market undoubtedly militates against mines producing only the white metal, but even if its price fell to 50 cents the Slocan miner could still make money. The ledges from which the silver is obtained are, in most instances, true fissure veins, which delight the heart of the mining engineer from their reliability. Many men sent out from London have strongly recommended Slocan properties to their principals, who have declined to purchase simply on the ground that they will buy nothing but gold. The field is left, therefore, chiefly in the hands of Americans and a few local men, who are reaping rich returns.

The country immediately contiguous to Nelson, which lies between the two districts above-named, is attracting more and more attention. The older claims which have been but scratched by their owners, who are mostly prospectors, are passing gradually into the hands of richer men and companies who are prepared to explore them farther, and at the same time new discoveries are being made of a character indicating valuable ledges. These have been hitherto passed over as impracticable or valueless, but their similarity in many of their main features to the rich deposits of Trail Creek, has added a new impetus to their exploration. The season is now approaching its end, and it is not likely that much will be done with them this year, but the spring will see work commenced on them on a large scale.

In this connection it may be mentioned that the whole of the Kootenay country is bound up with frost, and covered with deep snow for about four months in the year. At the higher altitudes, where most of the mines are, no surface work can be done between November and June. Operations can, therefore, only be carried on where there are comfortable quarters for the men, and the work is well underground.

The Hall Mines smelter was blown in again on October 10, all the repairs to the smelter having been completed, and a great deal of work already done in preparation for the new plant. The new



machinery at the mine is also at work, and the tramway is again bringing down ore. No shares can be obtained here at the present price, but the resumption of operations with the consequent publication of returns will probably have the effect of sending up the price again and renewing the market activity.

## WIGAN AND DISTRICT MINING AND TECHNICAL SCHOOL.

### ANNUAL DISTRIBUTION OF MEDALS AND PRIZES.

THE annual distribution of medals and prizes to the successful students of the above-named school took place on Friday evening last week.

The HON. SECRETARY read the annual report of the executive, which was as follows:—The Executive Committee have pleasure in presenting the third annual report since the reorganisation of the school, and the 39th annual report since its foundation. The session commenced on Monday, September 16, 1895, and terminated on June 30, 1896; and has been under the control of the joint authorities representing in equal parts the Wigan County Borough Council, the Lancashire County Council, and the old Mining School Committee. So far as the executive are aware there is no similar arrangement for technical instruction governed by, and available on equal terms to, borough and county, elsewhere in the United Kingdom; the arrangement attracted the Royal Commission on Technical and Secondary Education, and received their special commendation. It need only be said that the joint control works admirably; and, with three years' experience, gives satisfaction to all the parties concerned, and it is agreed that the work could not be so well done in any other way. The various appendices attached to this report deal with the whole work of the session, and all the examinations; and give full details of enrolments as to districts and as to classes; also the examination successes in every subject. Summarising and supplementing that detailed information, the following figures are presented as comparing the three sessions since the new arrangement came into existence.

#### NUMBER OF SUBJECTS TAUGHT.

1893-94—29; 1894-95—36; 1895-96—40.

#### INDIVIDUAL AND CLASS ENROLMENTS.

1893-94—623 and 1168; 1894-95—1337 and 2201; 1895-96—1734 and 2876.

#### ENROLMENTS TOWN AND COUNTY.

	Borough.	County.	Total.
1893-94	338	285	623
1894-95	819	518	1337
1895-96	1088	646	1734

Taking the adult students only, the percentages come out as follows:—

	Borough.	County.
1893-94	54	46
1894-95	86	45
1895-96	82½	47½

#### NUMBER OF CANDIDATES PRESENTED AND PASSED.

	Presented.	Passed.
1893-94	558	335
1894-95	919	636
1895-96	1635	1327

#### SCIENCE AND ART GRANTS EARNED.

1893-94	£243
1894-95	377
1895-96	530 (claimed but yet paid)

A few words of reference may with advantage be made to some of the departments. (A.) Mining and engineering: This has always been an important branch of instruction to which special attention has been directed, and the examination results are gratifying. Sixteen students have obtained their certificates as colliery managers from the Lancashire examination boards, and out of seven first-class honours to 2959 mining candidates in the United Kingdom, two were awarded to this school. (B.) Cotton: The executive fully realised when establishing these classes the difficulty of providing efficient instruction with a full equipment. It is pleasing to report, notwithstanding so serious a drawback, that in spinning two first-class honours and nine second-class honours and three first ordinary were obtained. The weaving class passed nearly all the students, but has been impeded by want of a loom, which has now been provided. (C.) Chemistry: Although in a temporary building, the chemical laboratory is well equipped, and has been put to more extensive use, with the result that 10 students were awarded first class in practical chemistry. (D.) Mathematics: Until recently this subject was much neglected, but it is so essential to success in other branches that it has been elevated to a prominent position. The examination results are eminently satisfactory in mathematics, and excellence in this has a good effect upon the subjects allied. (E.) Ambulance: The movement for providing practical instruction in ambulance for men and for women, and in sick nursing and cookery for women, has been very successful and much appreciated. The women especially have attended their classes in large numbers. The total number of certificates awarded after the examination by the St. John Ambulance Association during the year is 195. (F.) Art: The location of the art classes at the Grammar School, where a good commodious room suitable for the purpose is available, has justified the anticipations of the executive; and it is pleasurable to report a large increase of students, and an advance in the percentage of successes from 54 in 1895, to 69 in 1896. And this is the result in a year when generally the successes over the county have diminished. (G.) Manual: The working of this department is exceedingly gratifying; 750 lads from 30 elementary schools receive two hours' instruction in drawing and wood-working each week, and up to the present no school has failed at the Science and Art examination; 10 of the schools attained the highest possible standard. In addition there have been well-attended classes in woodworking and cardboard modelling for teachers, and woodwork for general students. The Knowles gold medal to the best student of the year has been awarded to Frederick Bowen, for success in geometry, mathematics, mechanics, and chemistry; and the silver medal to second best student has been awarded to Richard Starpler, for successes in cotton weaving. The executive congratulate these two students on their distinguished success, and hope for them both a prosperous future. In addition to these, partly from the funds of the school, and partly by the generosity of the following gentlemen—Mr. Alfred Hewlett Esq., Sir Francis S. Powell, Bart., M.P., £2 2s., Colonel Blundell, C.B., M.P., £2 2s., Mr. C. Gidlow Jackson £2 2s., the Mayor (Alderman R. Layland) £1 1s., Mr. James Brown £1 1s., Mr. Simon Brown £1 1s., Mr. Robert H. Edmondson £1 1s., Mr. T. Ratcliffe Esq., £1 1s., Colonel R. A. Warrington £1 1s., Mr. Henry Hall £1 1s., and Mr. William Johnson £1 1s.—the executive have been able to award prizes for distinction at the examination to the following students:—(A.) Science and Technological: Walter T. Garton, Robert A. Fort, John T. Hibbert, Peter Moorfield, Edward Whittle, John T. Anderton, Moses Ashurst, Thomas Ashurst, Thomas C. Aspinall, James T. Cooke, James C. Ekersley, William S. Fairbrother, John W. Gibson, Edward Hall, William Molyneux, Robert S. Smith, Henry Wells, and Thomas Westhead; (B.) Manual: Dorothy A. Balfour and Jennie Coates; (C.) Domestic and Commercial: Frances Arrowsmith, John Thomas Seddon, Thomas Macdonald, and John Wilcox. The first prize, value 30s., in French (commercial) was awarded by the Lancashire and Cheshire Union of Institutes to Jethro Bithell. (D.) Art: Fred Molyneux, John E. Moorfield, Thomas J. Corfield, Mary Houghton, Edgar B. Allen, Charles H. Heaton, William H. Naylor, Volney Stephenson, Hannah E. Tomkinson, Ellen T. Booth, Sydney E. B. Conway, Lilian M. John H. Liprot, Alice M. Martin, Charles H. Millard, Ernest W. Ralph, Thomas Walte, and Mary Webster.

## JOHANNESBURG CONSOLIDATED INVESTMENT COMPANY, LIMITED.

REPORT of the DIRECTORS, submitted to the Shareholders at a Meeting held in the Board Room, Colonnade Buildings, Fox Street, Johannesburg, on Monday, September 28, 1896, at 2.30 pm.

THE Directors submit herewith the Balance-sheet and Profit and Loss Account of the Company for the year ended June 30, 1896, showing a balance of profit, including the amount carried from last account, of £531,186 3s. 7d. This result has been arrived at after writing down the assets, where necessary, to the market value of the day. Since then the value in many cases has improved. An interim dividend at the rate of 30 per cent. per annum was paid to December 31, 1895, and the Directors have declared a further dividend at the rate of 20 per cent. per annum, together absorbing £199,500. This leaves a balance of £331,686 3s. 7d. to be carried forward. The Directors propose to place £250,000 of this amount to a separate reserve account by way of creating a dividend protection and equalisation fund.

Bearing in mind the conditions existing in Johannesburg at the end of last year and during the first six months of the present year, and the consequent stagnation in business and depreciation in values, the Directors consider the net result of the year's working to be very satisfactory. These adverse conditions have now passed away.

Since the close of the year covered by this Report the Founders' Shares in the Company have been extinguished, in accordance with arrangements already sanctioned by the Shareholders, and to do so the Capital of the Company has been increased to £850,000, of which 15,236 Shares are held in reserve.

The figures of the accompanying accounts show a marked growth in the business of the Company, which is still capable of great expansion. Some valuable fixed properties have been acquired during the year, and the full development of the real estate assets of the Company is being pushed forward. One large building has been completed and readily let at good rentals, and others are in course of erection, or about to be commenced. The business of receiving deposits and of making advances on first mortgage is also being cultivated within the limits of safety and profit. The administration of the mining department of the Company's business has been strengthened, and the number of Mining Companies for which this Company acts as secretaries has greatly increased.

At the Extraordinary General Meeting convened for this day, following the present meeting, resolutions will be submitted to the Shareholders for the adoption of certain provisional agreements between this Company and (1) the Barnato Bank, Mining, and Estate Corporation (Limited), and (2) the Johannesburg Waterworks, Estate, and Exploration Company (Limited), and for the further increase of the capital of the Company to £2,750,000 by the issue of 1,900,000 Shares of £1 each for the following purposes:—

	Shares.
To acquire the assets of the Barnato Bank, Mining, Estate, and Corporation (Limited) at the ratio of five Shares for eight Bank Shares	1,503,125
To acquire certain freehold and leasehold properties from the Johannesburg Waterworks, Estate, and Exploration Company (Limited) at the ratio of one Share for three Waterworks Shares, but without extinguishing the latter	133,333
To acquire the assets of the Houghton Estate and Gold Mining Company (Limited) at the ratio of one Share for three Houghton Shares	17,429
To acquire the Yeoville Estate from the Johannesburg Building and Estates Syndicate, at the ratio of three Shares for four Syndicate Shares	24,750
To acquire the remaining Shares not already in the hands of this Company of the Johannesburg Market Concessions and Buildings Company (Limited) and the Central Commercial Buildings Company (Limited)	21,504
	1,700,141

New issue to be offered to the Shareholders of the Company at 75s. per Share, at which price the issue is guaranteed free of any commission or option by Messrs. Barnato Brothers

£1,900,141

The above figures represent the number of Shares to be issued in exchange for the outstanding Shares of the Companies absorbed after deducting this Company's present holdings in these Companies. The cost of these holdings will in future be treated as a portion of the cost of the properties acquired. The excess of 141 Shares over the 1,900,000 above quoted will be taken from the existing reserve Shares, leaving 15,095 Shares in Reserve.

The amalgamation with the Barnato Bank, Mining, and Estate Corporation, Limited, has been decided upon to remove what would have been a formidable competitor in business; and, among its other advantages, it secures to this Company the undivided influence and support of Mr. B. I. Barnato and his firm, and of the large and important interests which he controls. The assets of the Bank include very valuable Mining and landed properties and interests, and large holdings in the De Beers and Jagersfontein Diamond Mines, and in the best Gold Mining and other Companies in the Transvaal.

The purchase of the Yeoville and Houghton Estates has already been effected, and when the above amalgamation is completed this Company's holding of real estate will be the largest and most valuable in Johannesburg, yielding a large present revenue, and, by the judicious expenditure of capital, capable of almost indefinite increase, both in value and yearly returns. The Company will own, in addition to its properties in the best business parts of the town, some thousands of eligible building sites in the most popular residential quarters of Johannesburg, which are at present in great demand and daily increasing in value. The Directors have the pleasure to report to Shareholders that the present asset of the Company in real estate in Johannesburg has just been valued by Mr. H. J. Morkel, Sworn Appraiser and Valuator, at the sum of £623,400. These properties now stand in the books at £208,381 13s. 6d. only, showing a profit of £415,018 6s. 6d. The balance of the amount of £269,941 15s. 3d., "Investments in Real Estate," appearing in the balance-sheet is represented by the Company's valuable property in Antinfrans, in the City of London, taken at the cost price of £61,560 1s. 6d.

The premium of £2 15s. per Share on the 200,000 Shares to be issued to Shareholders, amounting to £550,000, will be carried to the Reserve Fund, increasing that fund to £950,000, exclusive of the Dividend Protection Fund of £250,000, or £1,200,000 in all; and as a value of £4 per £1 Share has been taken as the basis of the issue of Consolidated Investment Company's Shares in the above purchase, a very large sum should accrue to the Reserve Fund from this source when the assets acquired are taken over and embodied in our accounts. With the Capital and Reserve Fund now contemplated this Company will stand at the head of Financial Companies in South Africa in the magnitude of its Shareholders' funds.

With practically unlimited capital at its disposal, the Company will be able to take up, or negotiate and float, Government, municipal, and other public Loans, or Debenture issues, and to undertake any other important banking or financial business.

In these and the other operations of the Company the Directors in Johannesburg are greatly assisted by the powerful support and co-operation of the influential London Board of the Company, with

Sir W. Lawrence Young, Bart., as Managing Director. The Directorate will be further strengthened by the addition of Mr. Charles Jessel, Bart., John Stroyan, Esq., and W. Garland Esq. (the last of whom will represent the Shareholders of the Johannesburg Waterworks, Estate, and Exploration Company (Limited)), who will join the Board after the Annual General Meeting.

The directors regret that they have lost the services in Johannesburg of the General Manager of the Company, the Hon. John Tudhope, who has removed for a time to the London Office. Mr. J. A. Hamilton, lately an inspector of the Standard Bank of South Africa (Limited), and Mr. Harold F. Strange, have been appointed Joint Managers, the former in special charge of the Financial Department of the Company's business, and the latter of the Mining Department. Mr. G. W. Starr, as Consulting Engineer, continues to give his undivided attention to the business of the Company, and Mr. R. Pizzighelli has been appointed Surveyor to the Company during the past year. Both gentlemen are assisted by an efficient staff.

Messrs. J. P. O'Reilly and John Munro, and Messrs. Chatteris, Nichols, and Co., the Company's Auditors in Johannesburg and London respectively, retire from office, but, being eligible, offer themselves for re-election.—By order of the Board,

H. M. NOBLE, Assistant Secretary.

#### BALANCE SHEET as at June 30, 1896.

##### CAPITAL AND LIABILITIES.

Capital	£800,000
Less Reserve Shares	2,000
	£798,000 0 0
Reserve Fund	400,000 0 0
Moneys on fixed deposit and on loan	1,000,884 17 6
Bills payable and other liabilities	417,583 9 0
South African Trust and Finance Company, Limited (for balance of purchase price of assets in suspense)	56,232 17 10
Balance Profit and Loss (after payment of interim dividend to December 31 last, amounting to £119,700)	411,486 3 7
	£3,084,194 7 11

##### ASSETS.

Cash on hand and at Bankers	£90,773 0 4
Loans on Market Securities in London and in Johannesburg	329,747 3 8
Loans to Mining Companies	507,139 6 7
Sundry Debtors	118,398 1 1
Investments in Real Estate	269,941 15 3
Investments in Mining Properties	86,734 2 4
Investments in Stocks and Shares, including Municipal Bonds and Shares in Mining, Financial, and other undertakings	1,487,536 8 4
Johannesburg Consolidated Investment Company, Limited, 15,000 issued Shares to be delivered to the South African Trust and Finance Company, Limited, as part of balance of purchase price of assets per contra	87,800 0 0
Machinery and Mining requirements in stock and in transit	32,350 17 3
Office furniture, fittings, and instruments	3,073 6 3
	£3,084,194 7 11

#### APPROPRIATION ACCOUNT (last Financial Year).

DR.	
To dividend to Shareholders registered July 31, 1895	£187,600 0 0
Reserve fund	400,000 0 0
Balance to this year's accounts as below	396,429 4 10
	£984,029 4 10
CR.	
By balance carried forward June 30, 1895	£984,029 4 10
	£984,029 4 10

#### PROFIT AND LOSS ACCOUNT, July 1, 1895, to June 30, 1896.

DR.	
To Directors' fees	£3,468 18 0
Salaries, including Auditors' fees	25,648 12 10
Interest and exchange paid	17,271 10 4
Establishment charges, including rent and taxes, insurance, stationery, printing, and advertising	8,737 12 1
Balance	£531,186 3 7
Less interim dividend at the rate of 30 per cent. per annum to December 31, 1895	119,700 0 0
Leaving, as per Balance-sheet Proposed to be appropriated as follows:—	£411,486 3 7
Income reserve account	250,000 0 0
Dividend at the rate of 20 per cent. per annum to June 30, 1896	79,800 0 0
Carried forward	81,686 3 7
	£411,486 3 7
	£531,186 3 7

CR.	
By balance from last account	£396,429 4 10
Gross profits for the year ended June 30, 1896, after valuing Securities in hand and at market price	189,801 9 0
	£586,230 13 10

"We have audited the accounts of the Johannesburg Consolidated Investment Company (Limited) and found them correct. We have also verified the Share Certificates and other Securities."

"CHATTERIS, NICHOLS, and Co."

Chartered Accountants.

"London."

"We have audited the accounts of the Johannesburg Office of the Company, and found them correct, and they and the accounts of the London Office are properly incorporated in the above Balance-sheet and Profit and Loss Account. We have also verified the Securities at Johannesburg."

"J. P. O'REILLY and J. MUNRO, Auditors."

"Johannesburg, September 23, 1896."



## THE MINERAL RESOURCES OF ARIZONA.

(FROM OUR OWN CORRESPONDENT.)

THE territory of Arizona has an area of 113,000 square miles (the whole of the United Kingdom has only 121,000 square miles), and a population of less than 80,000. The United States Land Office credits Arizona with 49,000,000 acres, or over 76,000 square miles of rainless region (i.e., a greater area than Ireland, Scotland, and Wales combined), where there is not a sufficient precipitation of moisture to raise crops. By means of artificial irrigation, diverting the waters of the streams on to the land, less than 2,000,000 acres are already under cultivation in the entire territory, though additional irrigation enterprises are now under way, which will increase such cultivated area. Wherever irrigation is rendered possible by the availability of streams, the natural climate, giving perpetual sunshine, and absence of snow and frost, gives 12 months of growing season and phenomenal crops of cereals, forage plants, vegetables, and fruits. In this way a man can spend one day at his mine, and the next literally "under his own vine and fig tree."

Arizona, however, is rich in minerals—gold, silver, copper, lead, iron, manganese, coal, &c. The total value of the output of gold, silver, and copper during the 19 years ending June 30, 1895, was \$115,739,128, or over £22,000,000 sterling.

The annual reports of the United States Mint credit Arizona as follows:

	Oz. Gold.	Oz. Silver.	Lbs. Copper.	Lbs. Lead.
1876	68,911	2,594,131	44,351,283	3,285,992
1895	96,313	1,539,453	31,162,400	2,625,000

The United States Mint report for the year 1895 is unusually late, as it has not yet been issued. Considering the very limited population of Arizona, and the still more limited extent to which outside capital has so far been invested, the above figures represent a very creditable performance.

The territory is subdivided into 13 counties, viz., Apache, Cochise, Coconino, Gila, Graham, Maricopa, Mohave, Navajo, Pima, Pinal, Yavapai, and Yuma, of which Apache, Coconino, and Navajo have not as yet developed mineral resources to any appreciable extent.

Cochise County, in the south-east, has an area of 6972 square miles, and is traversed by the Southern Pacific Railroad, and is one of the leading mining counties of the territory. In the Tombstone district the Tombstone Mill and Mining Company owns a number of mines, which in the past have produced over \$3,000,000, chiefly silver. The Contention Company has paid over \$3,000,000 in dividends. This company had two colossal pumps, each with a capacity for pumping about 1,000,000 gallons every 24 hours, to cope with the water in the lower levels, but fire destroyed both mines and pumps. The present low price of silver does not justify the company in replacing such an expensive plant for the purpose of resuming operations at present. The Grand Central Company, representing Ohio capital, owns or controls a number of rich silver properties. There are other prominent mining companies in the same district. Many of the mines are not operated by the owners, but leased to "chloriders," who pay a royalty on the ore they take out. The cyanide system of treating low grade ore is common, being quite successful. In the Huachuca Mountains the Copper Glance Mining Company has a large property and plant, and is a constant shipper. The Dos Cabezas gold district has a number of good properties. The Pierce mining district has some good gold properties, producing considerable quantities of rich ore. At Bisbee are large copper properties, the mines and smelters employing hundreds of men, the total production of one company to July, 1895, being 147,000,000 lbs.

Gila County has mining for its principal industry, but as it has not yet been reached by any railroad, its development has been to that extent retarded. In the Globe mining district are large copper mines, which have produced steadily for years, although the coke has had to be hauled by wagon a distance of 160 miles from the railroad. The Globe Mine alone in 10 years produced 65,000,000 lbs. of ingot copper. The Bisbee Company also has extensive mining interests. The northern portion of the county, near Payson, is a rich gold-producing section. With the advent of railroad communication, which cannot be long delayed, this county has an undoubtedly great future, as mineral is found more or less from one end to the other.

Graham County has an area of 7000 square miles, and is tapped by two branches from the Southern Pacific Railroad. The principal mining industry is carried on at Clifton and Morenci. The works of the Arizona Copper Company (representing Glasgow capital) are on the San Francisco River at Clifton, and the mines are from 4 to 8 miles distant. An elaborate system of tramways and gravity inclines connect the mines with the works, several locomotives being constantly employed in feeding the plant with ores and transporting the coke, merchandise, and copper of the Detroit Copper Company. One of these copper mines—the Longfellow—has been a steady producer for nearly 20 years. The more profitable ores occur in a lime and porphyry contact. This company employs 600 men, pays over \$400,000 in wages annually, and \$12,000 per annum in taxes, being about one-fifth of the entire taxes of the county. Its ore treatment plant is most elaborate, extensive, and efficient. The Arizona and New Mexico Railroad belongs to the same company, running from Clifton to Lordsburg on the Southern Pacific Railroad, a distance of 71 miles, 41 miles being in Graham County. It is a narrow gauge road, and is used exclusively in the work of the copper camp. This railroad gives employment to 70 men, and without it the mines could not continue in operation. The undoubted richness of the mines justifies the construction of the railroad by the mineowners. By means of this railroad anthracite coal is obtained from Cerillos, N.M., and by means of a special machine or apparatus manufactured in Glasgow, gas is made from the anthracite coal, and used to generate steam at a much less cost than any other fuel obtainable. The Detroit Copper Company, the mines of which have been steady producers for over 10 years, has blast furnaces and a concentrating mill at Morenci, the water supply being purged from the Gila River, a distance of 7 miles.

Maricopa County, traversed by the Southern Pacific Railroad, has an area of 7300 square miles, and its mountains show surface indications of gold, silver, and copper, but until recently nothing like scientific prospecting took place. In the Superstition Mountains several rich gold discoveries have been made, and a camp started. At other places in the county prospecting and development work are going on, as well as placer mining, the difficulties in the way being transportation and scarcity of water. There are, however, a number of small stamp mills in operation.

Mohave County, traversed by the Atlantic Pacific Railroad, has an area of 12,000 square miles. The United States Mint report for the year 1895, in the chapter on Arizona, says:—

"The yield of silver was more than double that of the year 1892. This came almost all from the White Hills district of Mohave County. The indications are that there will be a still greater increase in the year 1894, as it is not likely that the price of silver can drop low enough to make such rich ores unprofitable. In all other sections of the territory silver mining may be said to be at a 'boom'."

In this county, besides the White Hills district (on which the service recently sent a separate article to *The Mining Journal*), there are a number of companies operating gold and silver properties and placers, quite a number of such silver properties being leased by "chloriders" on royalty. Along the banks of the Colorado River and in the cañons of the Cerbat and Black Mountains are considerable areas of placer ground only needing water, or some kind of "dry" machines, which, dispensing with water, will save the gold, if such a machine is feasible. The great need, however, is capital, for many of the local enterprises do not seem to have the financial means for the necessary hoisting plants and the obtaining of water therefor, and the result is the cessation of operations before depth is gained.

Pima County, traversed by three branches of the Southern Pacific Railroad, has quite a number of mines in operation producing gold, silver, copper, and lead, over a dozen mills, none exceeding 20 stamps, however, and three smelting plants, one at Tucson for copper, one at Rosemont for copper, and one at Nogales for lead.

Pinal County, traversed by the Southern Pacific Railroad, has an area of 5368 square miles. The silver mines, mostly carrying low grade ore, are now quiet on account of the low price of silver. The Silver King is an exception, and is said to have paid over \$2,000,000 in dividends. It has a 20 stamp mill, as also has the Reymert Silver Mine. The gold mines at Mammoth Gold Field, Ripsey, and other places are active, and in connection with them there are mills aggregating over 200 stamps.

Yavapai County, traversed by the Atlantic and Pacific Railroad, and the Santa Fe, Prescott, and Phoenix Railroad (which connects the Atlantic and Pacific Railroad and the Southern Pacific Railroad) has numerous mines and over 30 plants, including smelters, stamp mills with an aggregate of 350 stamps, cyanide plants, &c.

Yuma County, traversed by the Southern Pacific Railroad, has only one large mine in operation, the Harquabala, which has a 20 stamp mill constantly at work. There are, however, large areas of placer ground more or less worked.

Speaking generally, the mining situation in Arizona may be summed up as follows:—

Owing principally to its supposed remoteness, the great mineral resources of this territory have not as yet received that attention from outside capital which they fully justify.

In consequence of Arizona having been in the past comparatively overlooked, desirable properties of considerable merit can be obtained at moderate prices and on reasonable terms.

In a number of cases at least, the necessary water supply can be obtained by the judicious expenditure of a moderate amount of capital in the construction of pumping plants, or dams and storage reservoirs, pipe lines, &c., or the sinking of artesian wells, which enterprises the richness of the mineral deposits fully justify.

In other cases, the mining properties are of such extent and value as to justify the construction of private branch railroads to connect the mines with the trunk lines of railroad, thereby reducing the cost of fuel supplies, ore freights, &c., as has been done in the case of the Arizona and New Mexico Railroad, built and owned by the Arizona Copper Company in Graham County.

The latitude and climate of Arizona give winters with the minimum of snow, absolute freedom from avalanches, or any conditions whatever to prevent continuous mining and shipping the year round.

The remoteness is more fancied than real, as practically any mine in Arizona can be reached in 14 days from London, and a proportionately less time from New York and other Eastern centres. The Atchafalaya, Topeka, and Santa Fe Railroad and its continuation, the Atlantic and Pacific Railroad, is the favourite route from Chicago, and the east to Southern and Middle California, not only for "globe trotters" and ordinary European tourists, but for the large numbers of wealthy Eastern people who spend their holidays, and more particularly the winters, in Southern California, which is for America what the Riviera, Nice, and Cannes are for the wealthier classes of Europe. This route, therefore, has quick through trains, with the finest Pullman service, and, speaking of personal experience, the best managed eating stations in the United States.

The one great need of Arizona to-day is capital in the hands of practical and enterprising men; and as its vast mineral wealth and mining possibilities become more fully realised and appreciated, increased attention on the part of practical mining men and capitalists will certainly be directed to them. With the judicious expenditure of capital, the annual output of Arizona in gold, silver, copper, and lead is capable of indefinite expansion—to say nothing of the known deposits of iron, manganese, coal, and other minerals, which will eventually be developed and utilised.

In conclusion, probably no state or territory in America is better worth the personal investigation of practical men with capital than Arizona.

THOMAS TONGE.

## SOUTHERN RUSSIA'S MINERAL TRADE AND INDUSTRY.—In a

report to the Foreign Office and H.M. Acting Consul-General at Odessa, it is stated that the British coal trade at that port

has not been able to recover from the blow it sustained some years ago, when, with a view to the development of coal mining in South Russia, a heavy duty of 6s. (which was afterwards raised to 8s. per ton, the present) was imposed on all coal imported at ports situated on the Black Sea. When duty free the influx of British coal had attained the high figure of 261,600 tons, since which time, fluctuating from year to year, it gradually fell to 92,963 tons in 1895, and that, too, notwithstanding the ever-increasing demand for coal fuel consequent on the great development which has taken place of late years in manufacturing industries of Russia, as well as the increase of coal consumption on railways and steamers, &c. Nor does there appear to be any likelihood of English coal regaining its ascendancy over its Russian rival, to judge by the steadily increasing quantities of the latter annually brought to Odessa, both by sea and overland, amounting in the aggregate to 196,760 tons, and thus showing an excess of no less than 102,300 tons over the British commodity. Important deposits of iron ores of various varieties are found in two provinces of the district—namely (1) at Krivol Rog, favourably situated near a railway in the province of Kherson, within easy distance of Nicolaieff, and extending along the borders of the neighbouring province of Ekaterinoslav; (2) in Volhynia, the deposits extending over the greater part of the province in a north-westerly direction. The former, with its rich veins of red, specular, and other ores, mineral colours, manganese ore, &c., seems to offer an attractive field for foreign capitalists, two French companies having established themselves in the district in question, while a Belgian company is about to invest some considerable amount of capital in the same enterprise. The beds of Krivol Rog are said to be the richest in Russia, their output of iron ore being estimated at 850,000 tons out of which supplies are drawn by most of the large works of the South Russian iron-producing district, of which it constitutes a part, and which, although only recently ranking next in importance to the Ural iron district, now stands first in point of productiveness. The quantity of pig iron produced in South Russia amounted in 1895 to 541,970 tons as compared with 471,310 tons produced in the Ural district. The output of the province of Volhynia amounted in 1895 to 3435 tons of pig iron. The old prejudice against Russian laws and customs continues to prevent many seemingly good Russian works from being undertaken by British firms. This prejudice appears to have been overcome by Belgians and Germans, into whose hands these works have now gone. The influx of late of Belgian capital into Russia has been enormous, attaining, it is said, some £20,000,000 sterling, the undertakings being mostly in the metallurgical industries. Out of about 50 various industrial undertakings started in South Russia during the last year and a half two only were taken in hand by British firms.

MATFLOWER GOLD MINE.—Mr. Chas. Gordon Duncan, of Glasgow, has been appointed general manager of this company, and leaves Plymouth to-day for West Australia.

THE shareholders of the Barnato Bank Mining and Estate Corporation (Limited) (in liquidation) are requested to deposit their old certificates on or after Monday, November 9, for exchange into new certificates of the Johannesburg Consolidated Investment Company (Limited), or same will be forwarded by post on receipt of the old certificates.

## THE CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA, LIMITED.

## REPORT OF THE DIRECTORS.

## 'Accounts.

THE directors of the Consolidated Gold Fields of South Africa (Limited) present to the shareholders the following report on the company's affairs, with the accounts for the year ending June, 30, 1896, and balance-sheet showing the position of the company at that date.

## Profits.

The realised net profit on the year's working, after deducting debenture interest and all outgoings, shows a balance to credit of £1,119,726 6s. 8d., out of which the dividend on the preference shares has been paid, together with an interim dividend of 10s. per share on the ordinary shares, leaving together with the amount brought forward from last year a balance still available of £1,946,053 1s. 6d. The directors recommend that a final dividend of 15s. per share be declared, free of income tax, making with the interim dividend 25s. per share for the year, and that £200,000 be added to the reserve fund, leaving a balance of £1,303,203 1s. 6d. to be carried forward to the credit of the current year.

In addition to the foregoing realised profit, the company's share investments, as per Schedule 1 (apart altogether from profit on values of shares as per Schedule 2, or from any appreciation in values on claim, properties, and estate holdings, as per Schedules 3, 4, 5, and 6), show on current prices a further large unrealised profit.

## Reserve.

The reserve account now stands at £387,727 9s. 9d., and to this the directors propose to add the amount of £200,000, referred to above.

## Capital.

During the year, under the agreement with the managing directors, confirmed by the shareholders on April 22, to which further reference is made hereafter, the ordinary share capital of the company has been increased to £725,000 by the creation and issue of 100,000 additional ordinary shares of £1 each, ranking *pari passu* with the existing ordinary shares.

## Investments.

The accompanying report of the company's consulting engineer, Mr. John Hays Hammond, supported by that of Professor George Becker, on the subject of working the deep levels, together with the map of the Witwatersrand district, deal fully with the company's investments, schedules of which are appended hereto.

The company's investments stand in the books at average cost or under, and all stocks stand at prices below those now current.

## Simmer and Jack Investment.

One of the company's most important holdings is in the Simmer and Jack Proprietary Mines (Limited). The registration of the new company, to which reference was made in the last report, has been completed, and shares have been issued to the shareholders in the Simmer and Jack Gold Mining Company (Limited) at the rate of three and a-half new shares for each old share. The 65,000 working capital shares have also been fully subscribed and issued, 60,000 shares being held in reserve for future issue.

An issue of £500,000 5½ per Cent. First Mortgage Debentures has been made at par to partially provide for the equipment and development of this extensive property.

The Simmer and Jack Proprietary Mines (Limited) is a parent company, owning the freehold of the Elandsfontein Estate; it, therefore, has the advantage, in addition to being the freeholder of that part of the property worked by the company itself, of receiving stand licenses and claim licenses from the sub-companies working on the estate.

The portion of the property worked by the company itself from the outcrops downwards amounts to 609 claims, and has almost, if not quite, the greatest length of outcrop of any of the Witwatersrand Mines, extending to nearly a mile. On this area several shafts have been sunk on the incline from the outcrop, the main vertical shaft cutting the reef at 258 feet. Three deep level shafts below the above-mentioned have been sunk, cutting the reef at the following depths:—

700 feet.

1125 "

360 "

Three other shafts are being sunk lower down still to cut the reef at an estimated depth of between 2600 and 3000 feet, which shafts are now down as follows:—

Rand Victoria	..	..	..	506 feet
Rudd	..	..	..	490 "
Rhodes	..	..	..	343 "

and the continuity of the main reef series in depth has been demonstrated by the English Tracey-borehole, which cut the reef in the lower portion of the property at 2397 feet. The mine has, therefore, been proved along its breadth and depth.

Mr. V. M. Clement, late manager of the Primrose, Simmer and Jack, and other important companies, has submitted a report on the property, which includes an interesting account of past work, and his estimate, at the date of his retirement, of the future possibilities.

In addition, the Simmer and Jack Proprietary Mines (Limited) have large holdings in the other companies working on their estate, as follows:—

	Proportion held.	Shares held.	Claims owned by Company.	Representing to Simmer and Jack.
Simmer and Jack				
East	40 ..	220,000	460 ..	1810 claims
Simmer and Jack				
West	70 ..	211,000	249 ..	1743 "
Rand Victoria	20 ..	133,681	956 ..	1910 "
Rose Deep	8 ..	30,000	181 ..	479 "
Total				5972 "

The above 5972 claims make, with the 609 claims held by the Simmer and Jack Proprietary Mines (Limited) themselves, a total of 1206 claims, which having regard to the outside assets and capital of the company, compare very favourably in value per claim with those of other first-class outcrop mining companies.

## Gold Fields Deep Investment.

The company's holding in Gold Fields Deep, although requiring a longer time for development than in the case of the Simmer and Jack, is its most important interest, as will be seen from the following brief schedule of the assets of that company, showing the vast claim interests the company holds on the best portion of the area of the Witwatersrand Goldfields.



**Gold Fields Deep (Limited).—Schedule of Assets.****Share Holdings.**

300,500 Robinson Deeps. (Total capital of company £400,000.)  
 48,992 Rose Deeps.  
 160,966 Glen Deeps.  
 153,350 Knight's Deep.  
 21,804 Simmer and Jack West.  
 87,725 Simmer and Jack East.  
 136,084 Rand Victoria Mines.  
 165,259 Jupiter Gold Mining Company.  
 5,000 Village Main Reefs.

**Claim and Estate Holdings.**

99 claims under Henry Nourse.  
 457 " on Elandsfontein and Doornfontein.  
 Interest in Booyen Estate, containing 807 claims under Crown Reef, Crown Deep, Robinson, Robinson Deep, and other first-class properties.  
 Interest in Ingensburg Estate.  
 45 per cent. interest in Concordia Estate.  
 Interest in Klipriversburg Estate.  
 " Turfontein Estate.  
 " Vierfontein Estate.

In connection with these holdings, the board attach great importance to the independent opinion expressed by Professor Becker, late Chief of the United States Geological Survey, on the payable nature of the deep levels of the Witwatersrand, which entirely bears out the advice received from the company's own engineers, and copious extracts from which are included in Mr. Hammond's report.

Professor Becker states: There is to my mind no doubt that if dynamite and freight charges on coal were at reasonable rates, and if the labour were better, and better economised, the Rand Mines could now mine and mill ore for 18s. per ton, the present expense being approximately 26s., and further summarises his report as follows:—

"In brief, then, it is very improbable that the ore of the deep mines in the region through which the Main Reef has been traced with certainty will show any general tendency to impoverishment; dykes and faults will probably give less trouble in the deep mines than in the outcrop mines; there is no ground for fearing unmanageable quantities of water, or even very serious pumping expenses; and the temperature will increase more slowly than in most regions. There are, in my opinion, no insuperable natural obstacles to mining on the Witwatersrand at a depth of 4000 feet, and no known reason why, under favourable industrial conditions, the expense should exceed the present cost at 500 feet."

At the date of the issue of the last report, the directors were able to confidently predict the existence of the Main Reef series throughout the company's holdings, and, since then, this prediction has been absolutely realised by the cutting of the Reef in the "Beauidenville" borehole (the position of which is shown on the accompanying map), in the shafts of the Robinson Deep, the Glen Deep, and the second series of the Simmer and Jack shafts, and also as regards other companies by the cutting of the reef in the Jumpers Deep, Langlaagte Deep, and development on the Crown Deep, Nourse Deep, and other properties.

An issue has been made by the Gold Fields Deep (Limited) during the year of £500,000 5½ per cent. first mortgage debentures at par.

The other principal holdings of the company are specifically referred to in Mr. Hammond's report.

**Rhodesia.**

The native outbreak in Rhodesia has necessarily retarded the progress of the country, and temporarily put a stop to business. The revolt, however, appears to be on the eve of suppression, and when the railway works now in hand are completed, the interests previously acquired by the company will receive increased attention.

**Condition of the Mining.**

The mining industry in the Witwatersrand is rapidly attaining that importance and value which the directors have long foreseen. The political disturbances at the commencement of the year 1896 caused a not inconsiderable interruption to its development, but the yield of gold reported since the resumption of full work reached the record total of 212,429 ounces for the month of August, 1896. There is no doubt that this total will be very considerably surpassed in the near future, and that the Witwatersrand, in spite of fresh discoveries of gold in Australia and elsewhere, will remain at the head of the gold-producing districts of the world. The profits to individual mines represented by the large aggregate yield above quoted have been very considerable, but it is estimated that the reduction in the pay of the native labourers which was inaugurated on October 1, and the beneficial results from restricting the supply of liquor, will result in diminishing the average cost of extraction by about 2s. per ton of ore, or 6s. per ounce of gold obtained, in which case the ratio of profit to the amount of gold produced will be largely increased. Certain legislative measures recently enacted are likely to improve the position of all classes employed in connection with the mines, judicious revisions of the conditions under which the work is carried on and necessary material is obtained, and due recognition of the pressing need for railway extension will further promote the success of the industry to the advantage of the Republic and of all interested therein.

**Management.**

As the shareholders will remember in March, 1896, with their sanction Mr. C. D. Rudd and the Right Hon. C. J. Rhodes ceased to act as managing directors of the company, and surrendered their right in perpetuity to a proportion of the profits of the company in consideration of the issue to them at par of 100,000 ordinary shares of the company—new capital—which are not transferable until June 30, 1899, in which shares Mr. H. E. M. Davies, as their representative in London, and Captain E. F. Rhodes, as their representative in Johannesburg, participated. Mr. C. D. Rudd and the Right Hon. C. J. Rhodes, and also Mr. H. E. M. Davies, have undertaken to continue to act as directors of the company for a minimum period of four years from July 1, 1895.

The business management in Africa has been placed in the hands of Mr. E. S. Birkenruth and Major H. L. Sapte, as joint managers; and Mr. C. D. Rudd leaves shortly for South Africa to consult with them on the spot on all matters affecting the company's interests.

**Engineering.**

Arrangements have been made with Mr. John Hays Hammond, who has previously acted as consulting engineer to the company in Johannesburg, to remain as the company's consulting engineer in London for a period of three years from July 1, making periodical visits to Johannesburg. Mr. Hammond's services and experience are placed solely at the disposal of the company for this period, his remuneration being covered by 1½ per cent. of the net realised profits of the company. Mr. H. H. Webb has been appointed resident superintending engineer at Johannesburg, to take control of the engineering staff there.

**Board.**

Mr. Thomas Rudd has, with much regret, found it necessary, for private reasons, to resign his position as Chairman of the company, which he has held since its foundation, but still remains a director, and Mr. H. E. M. Davies has been appointed Chairman. Captain E. F. Rhodes has retired from the board, and the Right Hon. Lord Harris has been elected to the seat vacated by him, and has also been appointed deputy Chairman.

**DIRECT METHOD CONSIDERED AS THE FUTURE METALLURGICAL TREATMENT OF COPPER ORES ARGENTIFEROUS OR OTHERWISE.**

By CHRISTOPHER JAMES.

(Continued from page 1353.)

**Melting for Coarse Metal.**—The furnace in which this operation is conducted is of the same reverberatory type as the calcination furnace, but differs from it in many particulars.

The corners of the rectangular structure are rounded off on the inside, so that the laboratory part approaches an oval form. The relative size of the grate and laboratory is also different, since a higher temperature is wanted here, so the laboratory is much smaller compared with the grate than in the calciner. The grate area should be about one-sixth of that of the laboratory.

There is a door in front of the surface, through which the slag is withdrawn by a process of skimming. And there is a hole at the side of the furnace, through which the coarse metal is tapped out. The ore mixture is introduced from a hopper at the top of the furnace, but larger portions, such as the slag from later operations, are thrown in by hand through the front door.

The charging, melting, skimming, and tapping altogether occupies six hours, so that four charges are melted in 24 hours.

The charge weighs about 46 cwt., and consists of the calcined ore from the first operation mixed with a proportion of such ores as do not need a previous calcination and slag from the fine metal furnace, which still retains a portion of copper to be recovered.

The bottom of this furnace, like that of all melting furnaces used in the Welsh process, is made of silica sand.

Nature has been particularly favourable to the Swansea smelter, in providing him with his supply of cheap fuel; and also the refractory materials of best quality needed to construct his furnaces are found in the immediate neighbourhood. Silica sand, especially adapted to make a good furnace bottom, occurs within a convenient distance.

The bottom is made in the following manner:—A layer of about 18 inches of sand is first charged in and thoroughly calcined. The surface is then formed by paddles. It is made slightly cup-shaped, with a gentle inclination from all parts towards the tap hole. The furnace is now closed and the heat driven on till a high temperature has been attained, sufficient to cause the grains of sand at the surface to cohere by partial fusion. The temperature is then gradually lowered to avoid the cracking of the surface shell, and when cooled to a low red heat the surface will be hard enough to receive a charge of slag, which is then melted and absorbed into the bottom, and the furnace is again cooled. This constitutes the first bottom, which is intended to last for a long time. The actual working bottom is made on this, for which purpose a further layer of sand, about 6 inches thick, is spread on the first bottom, and this layer is again calcined and formed, and the heat raised to melt the surface and then again cooled as before. A little slag is melted on the surface and allowed to soak in, and the furnace is again cooled. A small charge of the coarse metal produced in such a furnace is melted on the bottom, so as to saturate it, and the excess is tapped out. The bottom is now ready to receive the usual furnace charge.

This upper bottom is subject to attack by the basic ingredients of the charge, and consequently has but a limited life. When it is worn through in places, the whole of it is lifted and removed, the furnace emptied, and a new working bottom constructed.

The life of such a bottom depends upon the nature of the materials melted, and the perfection with which it was first made. If it cracks or flakes off in the beginning, it will not last so long. The first, or under, bottom will last out several upper bottoms, but that in time will become destroyed. Besides, these bottoms are continuously absorbing portions of the melted charge, and become richer and richer in copper as they grow older, so that a time will come when it will be advisable to remove the bottom in order to recover the copper that has accumulated therein.

The reactions aimed at in the coarse metal furnace are brought about by the ingredients of the charge only, and do not depend upon atmospheric air. There is, therefore, no necessity to maintain an oxidising atmosphere, as is the case in calcination and in the subsequent roasting process.

The calcined ore contains small proportions of oxidised compounds of copper, such as sulphate and oxide of copper, but the main effect of the calcination has been to produce much oxide of iron. Some unchanged sulphide of iron, however, always remains as well. The raw ore added also contains, as a rule, some sulphide of iron, and sometimes oxides of iron and copper, or oxidised compounds of these metals. The slag used also contains copper in the oxidised form.

During the melting, the oxides and oxidised compounds of copper contained in the calcined and the raw ore and in the rich slag react with sulphide of iron so as to produce sulphide of copper, oxide of iron, and sulphide dioxide which escapes. And, again, sulphur dioxide is formed by the reaction between peroxide of iron and sulphide of iron, whereby the peroxide becomes reduced to protoxide. This production of protoxide of iron occurs simultaneously with its combination with silica to form the fusible silicate of iron. The main object of the oxide of iron in the mixture is to flux the silica and infusible silicates of the ores, and this fluxing action is sometimes assisted by adding lime or ores with a calcite gangue to the charge.

The success of the operation, of course, largely depends upon the composition of the mixture charged in. The oxide of iron and lime present must be enough to flux the silica, not necessarily to a neutral silicate, but to an acid silicate, for it is an advantage to have a light slag. There must on no account be too much oxide of iron present, or a basic silicate of iron will form which is too heavy to admit of a perfect separation of the fine shots of coarse metal, at first distributed through it, and the slag thereby rendered foul.

Under all circumstances the slag must be carefully examined for these shots before it is finally discarded, and any portions found unduly charged with such shots are kept and added to the next charge. It is the usual rule where the men are paid by the ton that all foul slags are to be remelted free.

The proportion of oxides and oxidised compounds of copper present must also be carefully balanced, as the richness of the resulting metal will depend upon that proportion.

The richer the metal is in copper the less of it there will be for subsequent treatment, therefore it is desirable to get it as rich as possible. On the other hand, if too rich, there will be too great a tendency for the passage of copper in the slag. From 30 to 35 per cent. of copper is the richness usually aimed at.

The remedy for any error in the mixture is, of course, easily discovered by the smelter. If the metal be too poor more calcined ore should be added, or the calcination pushed a little farther, as may be most convenient. If the metal be too rich, more pyrites ore must be added to the charge.

If the slag be too thick, more oxide of iron or lime in some form is added. If the slag be too thin it will take more silica, and at the same time be improved in specific gravity. This is the usual method of arriving at a good smelting mixture in a works.

\* A paper read before the Institution of Mining and Metallurgy.

The charge having been placed in the furnace, the door is closed and luted, and the heat forced on for about an hour and a half, found quite melted. A stirrer is now introduced to scrape off any unmelted portions that may have stuck to the bottom, and to stir them to the surface and to the action of the heat, the door is again put up, and in about another hour the charge will be ready for skimming. The slag is skimmed off at the front door, and allowed to run into sand beds previously prepared for its reception. The first cavity which receives the slag, under the door way, is cavity, from which it overflows into the others, so that any shot of metal that may be withdrawn, by accident, will have the copper unity of settling in this middle cavity, and thus collected all in one block of slag called the runner, or plate slag.

The quantity of metal resulting from one charge may not be sufficient to form a tap. Usually the furnace is only tapped after the melting of two charges. So after skimming the first charge the next is dropped in upon the bath of metal, and even when tapping it is advisable not to run out all the metal, but to leave a bath covering the bottom to receive the next charge upon. This tends to prevent the material from adhering to the bottom of the furnace.

**Calcination of Coarse Metal.**—This operation is conducted in a similar furnace to that used for the calcination of the ore, but it occupies a longer time, usually from 24 to 36 hours. Quite half the sulphur present should be removed in this operation.

The object is to decompose the regulus so far as it consists of sulphide of iron, to eliminate that sulphur and to oxidise the iron so that in subsequent melting a regulus shall be produced consisting essentially of sulphide of copper, although this point is seldom actually reached in practice, as during the calcination some sulphide of copper is always unavoidably produced.

It is usual to withdraw the charge into a vault underneath the furnace, and water is often poured on it to cool it. In this way sulphate of copper is washed out. The ground below becomes soaked therewith, and crystallised blue stone may be found creeping away for a considerable distance, especially if the foundations were not well concreted to begin with.

Sulphide ores of a similar produce in copper to the coarse metal are treated for the first time in this third operation, and they may, with advantage, be crushed together with the coarse metal, and the mixture thus obtained charged into this calciner.

**Melting for Fine Metal.**—The calcined coarse metal in admixture with siliceous oxidised ores, siliceous works products, such as the pieces of broken up bricks and old sand bottoms derived from the destruction of other furnaces, or removed for purpose of repair, and slags rich in copper, such as the refinery or roaster slags, are melted in the fine metal furnace. This furnace is similar in construction to that used for operation No. 2. The products are fine metal and fine metal slag.

The fine metal varies in character, depending upon its richness, which may range from 65 to 80 per cent. of copper. The varieties are known technically as blue metal, white metal, and pimple metal. Blue metal contains from 65 to 70 per cent. of copper, and has a close-grained fracture of a bluish colour; white metal from 70 to 75 per cent. of copper, and is coarse-grained in fracture, and when broken cold sparkles; pimple metal from 75 to 80 per cent. copper is covered on its surface with little excrescences, due to the evolution of sulphur dioxide during setting, and its fracture presents little hollow spaces, with filaments of moss copper shooting across them.

Fine metal slag contains about 3 per cent. of copper combined with silicate, and is made still richer by the presence of shots of fine metal. It is a very thin, heavy basic slag, containing dissolved magnetic oxide of iron, which separates on cooling, and often crystallises in hollow spaces.

The slag is skimmed off at the front door, as in the previous melting process, and the metal is tapped into sand moulds.

The reactions which occur in this process are due to the presence of oxidised compounds of copper and iron, uneliminated sulphur, and silica.

The reaction between oxide and sulphide removes a further quantity of sulphur as sulphur dioxide.

The necessity for the presence of silica in some form in the charge will now be well understood. If it were not present the sides of the furnace would be rapidly attacked, as the large quantity of oxide of iron present must have silica from somewhere to combine with.

A further action of the silica is to serve as a scorifying agent; it thus prevents iron from being reduced and returned to the regulus, and it induces the scorification of certain metals present as impurities, and the resulting regulus is the purer in consequence.

Some copper is unavoidably scorified by this action at the same time, and the slag contains invariably a small proportion of combined copper. By reducing the proportion of silica in the charge, the slag could be made freer from combined copper, but the regulus would then carry more iron, and the elimination of oxidisable impurities would be rendered null.

**Roasting.**—The furnace used in this operation resembles in general structure the other melting furnaces previously described. It differs, however, in one or two important particulars. The relation between the areas of grate and laboratory is not the same. The laboratory being four to five times, instead of six times, the grate area, as a better means for producing a high temperature quickly is desirable here. The laboratory is not made smaller, but the grate larger, that the ore or metal furnace grate.

The metal to be charged in is in large lumps, and cannot be let in through a hopper, as in the other cases, so a door is constructed in one side for charging.

It is also important that an oxidising atmosphere shall be maintained here without reducing the temperature too much. Channels are, therefore, constructed at the grate, and through the bridge of the furnace small apertures, the size of a brick, being left open to the laboratory side.

The air thus entering the furnace is warmed in passing, and at the same time it serves to cool, and so preserve the bridge itself. There is an entrance to this channel on each side of the grate, and when it is desired to force the heat these entrances are plugged with bricks loosely fitting in.

At a certain period of the operation more air is desired than even this channel can admit, then the side door is slightly opened, though generally during the melting this door is tightly luted.

The charge consists of about 4½ tons of white metal, which is piled in large lumps, filled up so that air can freely circulate between them. The complete charge, therefore, occupies all the space of the furnace, being piled right up to the roof.

The charge is then slowly sweated down, so that the metal drops across a current of air. In this way enough oxygen is carried into the bath to initiate the roasting process.

When the pile has sunk down, it is in a pasty condition, but the admission of much air has prevented a high temperature. The side door is then closed, and the heat raised; then commences the true roasting process. The surface of the bath is in a boiling state, due to the evolution of sulphur dioxide caused by the interaction of oxides and sulphides in the body of the charge, and this continuous motion causes fresh portions of the molten charge to be presented to the air for oxidation. This roasting continues for about six hours, during the whole of which time the "burn" and "frizzle" of the reaction are constant, until the copper gradually passes into the metallic state, when the phenomenon of copper rain commences. Copper rain consists of fine shots of copper, up to a size of copper, and much of it is carried away by the draught of dust of copper, and much of it is carried away by the draught of dust of the dust collected from the roofs of the smelting houses in the vicinity of the roaster stack.

Due to the scorifying action of the silica present in the charge (adhering sand from the sand moulds in which the white metal was cast), and in the furnace lining itself (consequently remains as necessary after each operation), a quantity of slag is produced on the surface of the bath; and this is skimmed off twice during the



operation, once soon after the first fusion, and once immediately before tapping.

As the copper is tapped whilst there is still some considerable action of the sulphur present going on, and this action continues after the copper is in the sand moulds, causing the surface of the pipe of crude copper to break through into a number of small craters, like miniature volcanic craters, and the copper is then known as "Pimple" copper.

If it is retained in the roaster furnace for a longer time, so that more of the sulphur may be eliminated before tapping, the pimple is not produced. But still the small quantity of remaining sulphur continues to act after tapping, but at a slower rate; and the escaping sulphur dioxide, instead of breaking through the surface of the copper, which has had time to set into a solid skin, lifts up the surface into a mammillated form, and such a pitch of copper is known as "Blister" copper.

The transformation effected in the roaster is mainly due to the oxidation of the sulphur and sulphides.

As first a portion of the sulphide of copper is oxidised into sulphate and cuprous oxide, and this cuprous oxide sinking into the bath reacts upon the unchanged sulphide of copper. Thus the bath portions of oxide of copper are constantly being produced by the oxidation, and as constantly this oxide sinks and reacts upon the sulphide.

The products of this reaction are metallic copper and sulphur dioxide. Foreign metals present in the white metal are largely eliminated by scorification, and enter the slag; such as form volatile compounds are also formed. It is, therefore, always advisable to construct condensing chambers between the furnace and the roaster to collect as much as possible of the vaporised copper.

Refining.—This last operation is conducted in a furnace which differs in construction from the previously described melting furnace in the following particulars:—

The bottom is made to incline from all parts towards a well close to the front door. The finished copper is removed from the furnace by ladling from this well; there is no tap-hole at the side of the furnace, nor is there any hole in the roof for charging by ladle, and the depth between the roof of the furnace and the bed is greater.

The grate is much larger and deeper, the laboratory being only four times the grate area.

There is a larger door on one side for charging. The pigs of "Pimple" or "Blister" copper are introduced through this side door.

The pigs of copper are piled up irregularly on the bed in charging, so as to leave passages for the flame through interstices.

As much copper is piled in as can be got into the furnace, filling the space up to the roof. The usual charge is about 11 tons.

After charging, the door is luted close, and the heat raised till the pigs of copper are melted.

The first part of the refining process now commences. Air is introduced, and the molten copper is beaten with iron tools in order to prevent large surfaces of molten metal to the air, and so cause a thorough oxidation, thus removing by oxidation all traces of impurity. But, in doing this, much copper becomes oxidised at the same time, and the oxide of copper formed is dissolved by the bath of molten copper.

There is, however, a limit to the solvent power of molten metallic copper for oxide of copper, and when this limit is reached the bath is saturated, and any further oxide of copper formed goes into the slag. This point of saturation is ascertained by an examination of the fracture of a small test piece taken out from time to time by the refiner during the progress of the operation. If it be so saturated, the copper is said to be "dry," and the fracture of "dry" copper is easily crystalline, and dark red in colour.

This point being reached, the slag is skimmed off, and the second part of the operation commenced, which is called poling. For this purpose the molten charge is covered with a layer of charcoal or some coal, and a pole of wood introduced through the front door and depressed into the copper by packing up the outside end. The evolution of steam and other gases from the green wood causes a great commotion in the bath. Fresh portions of the molten metal are constantly being presented to the action of the carbonaceous covering. This reduces the oxide of copper to the metallic state once more. The progress of this reducing operation is ascertained by taking out test pieces with a small ladle, and the character of the copper examined by hammering the test piece, and breaking it in order to expose the fracture.

The object now is to produce a metal with the maximum malleability and toughness. The presence of oxide of copper makes it brittle and short. It is found, however, that the reduction of the oxide must not be carried too far, or the copper again loses its toughness, and becomes what is called overpolled. But there is an exact pitch between the highly oxidised underpolled copper and the overpolled pitch at which the copper is most malleable and tough, called the tough pitch.

The tough pitch condition is easily ascertained by the practised eye from an examination of the fracture of the test-piece; and when this condition is reached the pole is withdrawn, the heat raised, and the slag again skimmed off. A few loose pieces of wood are now thrown in, and the lading commenced. So sharply defined is the tough pitch that very little oxidation, on the one hand, or reduction by surface charcoal on the other, will affect it. The charge has to be continually tested during the lading to see if the tough pitch is being maintained. The slightest tendency to variation, on one side or the other, is recognised by the refiner, and the conditions altered accordingly; that is to say, the introduction of more air or more wood, as the case may demand.

The final reduction of oxide of copper may be effected far more rapidly by adding lead than by poling, and when the copper is required for mill purposes the poling operation is generally finished by adding lead to the charge. The main effect of the lead is to reduce oxide of copper, and the bulk of the lead, at any rate, passes into the slag, although some maintain that the trace of lead retained in the metallic state and alloyed with the copper assists in giving it toughness. This may be true; but, as it seems so rest entirely on faith, like many other notions of the copper refiner, there may be a difficulty in securing any general acceptance of the dogma.

The slag is skimmed off three times during the refining operation, immediately after the melting, just before poling, and just before lading. The slag is very rich in copper, usually containing about 40 per cent. The two main reactions occurring in the refining process are oxidation by air and reduction by carbon.

The oxidation is pushed to the utmost in order to remove, as far as possible, the sulphur and iron, also arsenic, antimony, and bismuth, which are generally present. This is never perfectly done, however, for most commercial copper will yield, on a careful analysis, small proportions of all these impurities.

The generally accepted theory of overpoling is that the presence of a proportion of oxide of copper will neutralise the injurious effect of other impurities.

If this be so, it would seem to follow that absolutely pure copper would need this medicinal dose of oxide of copper, and that such copper cannot be overpolled—that is to say, a perfect reduction of the oxide of copper would still leave a tough copper, for it is well known that overpoling can only reduce the oxide, and cannot affect the character of the copper by the introduction of carbon, for no carbon is present in the copper; this is admitted on all hands.

Arguing in this way, it was at first thought that electrolytic copper would be sufficiently pure to undergo overpoling without detriment; but this is quite a mistake, no copper has yet been produced which can be overpolled without showing all the usual characters of overpolled copper.

#### Variations in the Welsh Process.

The Best Selecting Process.—In the Welsh process the ordinary impurities in copper ores which would injure the quality of the resulting copper are largely eliminated *pari passu* with the elimination of the sulphur. And other things being the same, the more

treatment an ore receives in order to calcine or roast away the sulphur, the purer will be the resulting copper be.

In some cases, however, the utmost treatment in the ordinary way will fail to produce a good copper. With such an ore, or with ordinary ores, if a copper of exceptional purity be desired, a special process called the best selecting process must be performed.

This process depends for its success upon the fact that copper will remain combined with silver longer than those metals (arsenic, antimony, bismuth, &c.) which it is desired to eliminate.

To this end an extra operation is introduced between the fine metal melting and the roasting, in which a portion of the copper present is reduced to the metallic state by the same reactions as those which occur in the roaster proper. And when the charge is in this state of part copper and part regulus, it is tapped out, when it is found that the injurious impurities are concentrated in the copper, and the regulus will be exceptionally free from them.

The two products, copper and regulus, remain quite separate in the moulds, the copper, by its greater gravity, being at the bottom. When the pigs are cold, the regulus can be easily stripped off from the copper bottoms.

This purified regulus is now brought out alone by roasting and refining, and laded in its moulds, thus forming best select ingots.

The impure copper bottoms are afterwards refined into an inferior quality of copper known as "tile" copper, and used for making hard brass castings.

*Separate Treatment of Rich Slags.*—It has been shown that, in the roaster and refinery furnaces, impurities become scorified and collect in the slag. When these rich slags are added to the charge in the fine metal furnace, the sulphur recombines with these impurities, and they are returned to the resulting white metal, and therewith to the roaster and refinery furnaces, where they are once more scorified into slag. They perform a circle, in fact, which does not include a calcination, and it is well known that the calcination process is the best purifier, causing the impurities, arsenic, antimony, and bismuth to largely escape as vapours.

For this reason the rich slags are dealt with in a separate operation, where they are mixed and melted with coarse metal. They give up their copper and impurities to the coarse metal, raising its pitch, it may be, to 40 per cent. of copper.

The slag from this operation is still foul, and has to be returned to the coarse metal furnace. The regulus, called now slag furnace metal, is granulated and calcined. There is another advantage according from the practice of this process when the usual product of the coarse metal furnace is very low in copper contents from an insufficiency of ore calcination, or from the stock of ores being more sulphury than usual, for it improves the pitch of the coarse metal.

It introduces an extra treatment, and so adds to the general working expenses. But the advantages are often considered equivalent, and sometimes its practice will enable the smelter to dispense with the calcination of the ore, at any rate, in part, and so something is saved which helps to meet the extra cost of the process.

*Omission of the First Calcination.*—The procedure in a copper works is largely governed by the nature of the materials to be treated, and it often happens that the proportion of sulphuretted mineral is so small that the smelter cannot afford to lose it. In that case the first calcination is omitted.

Sulphur is the valuable agent which serves to collect the copper from all oxidised ores and compounds. The discarded slag, to be sufficiently free from copper, must be drawn off from a regulus poor in copper. To make the first regulus poor enough sulphur ores are needed. When such ores are scarce, therefore, the smelter cannot afford to drive away sulphur by a calcination of the ore, and the necessary oxide of iron required to flux the silica must then be obtained in some other way.

*Running-down Methods.*—When the regulus of the fine metal furnace is low in copper, if, for instance, it is what is called blue metal, it is advisable to concentrate it up to white metal before charging it into the roaster.

This concentration is effected by a running-down process.

The pigs of blue metal are piled on the bed of a melting furnace and sweated down in a current of air. The surface is then skimmed, and the air allowed to act upon the charge, bringing about the usual reaction of roasting, until the regulus has been raised to the pitch of white or pimple metal, when it is tapped out.

If in this operation any small quantity of metallic copper should be produced, it will be found as a bottom of black copper under the runner pig—that is to say, the pig next the tap hole, and such bottom is kept for making the tile copper.

Of course, when such bottoms do occur they have the effect of purifying the accompanying regulus in the same way as the best-selecting process, but not to the same degree, because of the smaller quantity of bottoms produced.

*Entire Omission of Calcination.*—In some works the running-down process is adopted throughout, beginning with the coarse metal from the first melting, and the operation repeated a number of times until the regulus has been raised to the necessary pitch to charge into the roaster furnace.

The iron is entirely removed from the coarse metal by scorification, and impurities not easily scorifiable are not so effectually removed as when the operation of calcination intervenes.

True, an improvement in quality may be effected by drawing bottoms during the last running-down melting, but generally the variation does not yield such good copper as the ordinary method, and when adopted only good ores should be selected to be treated.

#### Modifications of Plant.

*The Baboon Furnace.*—This is a combined melting and calcining furnace, the calcining portion being constructed above the roof of the melting furnace. The flame from the grate first enters the melting furnace below, and the efficient heated gases are made to pass over the bed of the calcining furnace above. The object of this construction is to economise heat, which it certainly does, but there are drawbacks which more than counterbalance the advantage thus gained. A stronger set of studs and cramps are needed to hold the structure together, and even then there is a danger of the furnace bellying out in the middle. The roof of the melting furnace is also the bed of the calcining part; it thus becomes heated on both sides, and its expansion is considerable.

Again, repairs are rendered very costly. The intermediate roof, being always kept at a higher temperature, does not last so long as one exposed on one side to the open air, and in order to renew this middle roof much extra labour is entailed, and the support of the upper roof is so far interfered with that it can seldom be preserved. These drawbacks have led to the abandonment of the modification in most cases.

*Modified Calciner.*—A storied or double-bedded calciner is constructed on the same principle as a baboon furnace, but is less open to objection, as the temperature is never so high.

The charge is first placed on the upper bed, then raked on towards a hole communicating with the lower chamber, where it is dropped through, and then raked along the lower bed towards its hottest end, where there is the usual discharging hole.

Twice the number of men are required to work this form of furnace, and twice the amount of material is got through in the same time, and no more fuel used than with the ordinary single-bedded furnace.

Movable wooden stages are sometimes used for the men to work the upper story, and sometimes permanent high level floors are constructed for that purpose.

There is an economy in the use of this form over the ordinary calciner, and occasionally the modification is carried still further by the addition of a third story; the advantage of this extra bed is not, however, so apparent.

The same difficulty of carrying out repairs obtains here as in the baboon furnace, and to meet this difficulty calciners of double length have been constructed; these have all the advantages of the storied furnace without the accompanying disadvantages, and, where space is of no consideration, are in every way better.

Improvements that have from time to time been introduced or attempted in the Welsh process.

Notwithstanding the prejudice and conservative love of old methods of the Welsh copper smelter, yet some few improvements have crept in in one or two of the old Welsh process works.

The use of the blast furnace for cleaning slags and making coarse metal is one of these.

The best type of furnace in use for this purpose is the American water jacket furnace, which will be described further on.

Opinions differ as to the economy of this improvement in a district where coal is so cheap. Some firms have adopted blast furnaces for years, and then discarded them in favour of the old reverberatory furnaces. Others have persisted in their use, and proved their value. No doubt the dislike of the workmen for what they regard as an innovation is a strong factor towards determining the failure of what might otherwise prove to be a benefit. And there seems to be no other way of accounting for the discontinuance of the use of blast furnaces, unless the technical ignorance of the management be added thereto.

Another important improvement which is slow in being adopted is the use of gaseous fuel. It has been proved that gas furnaces, with the Siemens' regenerator combined, effect a saving of quite two-fifths of the fuel, and, moreover, can be used with very inferior fuel.

And this is not all, for there is also a great saving in labour. Much of the time of the farnacemen is occupied in clearing his fire, feeding the fuel in, and regulating the grate, which is all saved where gas furnaces are used.

(To be continued.)

## MINING IN CORNWALL

AND DEVON:

NOTES ON MINING IN THE WEST.

(FROM OUR OWN CORRESPONDENT.)

THERE is undoubtedly a more hopeful feeling among those who are interested in the mining industry, though it might be difficult to account satisfactorily for its existence. The impression prevails that we are on the eve of a substantial rise in the price of tin, that the worst of the depression is over, at least for the present. Whether the improvement is likely to be permanent is not a question which troubles mining men very much. Ever living in the present, they do not trouble themselves about what is likely to happen even in the near future. There has been rather more activity, or perhaps it would be more correct to say, less absolute stagnation, on the market during the last week or so. The low prices ruling have attracted some speculators out of their long retirement, and some shares in the leading mines have changed hands. What transactions have taken place have been almost entirely confined to Dolcoath, Basset Uniteds, East Pools, and Wheal Grenvilles. Most of the other mines are existing rather than enjoying vigorous life, and the number of "knocked" concerns would certainly be largely added to were it not for the hope of a better price for mineral in the near future.

The last report issued by the management of Basset United shows that there are several fairly productive points in operation, but at present prices the shareholders cannot look for anything but a meagre return unless some substantial improvements take place underground. Marriot's shaft is now down about 60 fathoms from surface. Another 35 fathoms of the shaft have to be bricked, and this work will be commenced in about a week. The building of Marriot's engine house is being pushed on as rapidly as possible, and it is hoped that everything will be ready for the new engine and machinery in time for their delivery from the makers. The West Frances shoot of tin has not yet been reached. The tin sales from this mine for four weeks were over 53 tons.

WITH the approach of a winter which threatens to be unusually severe, the problem of the unemployed will again have to be faced in the Cornish mining districts. Last winter the measures which were so promptly taken did much to alleviate the sufferings of the workless miners and those dependent upon them, and it is to be feared that a further appeal to the charitable will be necessary at no distant date. Men are still leaving the country for South Africa and other mining fields, but the case of those who from old age, indifferent health, or other causes are unable to emigrate has still to be considered. It is recognised that the most philanthropic cannot be for ever putting their hands into their pockets for the benefit of the unemployed Cornish miners, and hence the suggestions which are now being made—that men should be employed at weekly wages by the boards of guardians. If any such scheme were put into operation—and the reasonableness of a plan which would pay the distressed miner out of the pocket of the scarcely less distressed small shopkeeper or farmer is hardly apparent—it is not likely that the Local Government Board would sanction it. Besides, in what respect does assistance of this kind really differ from ordinary parish pay?

HOPES are now entertained of a Limited Liability scheme to work East Pool, Wheal Agar, and South Crofty as one concern. The latter mine has been stopped for some time, though there are many who still have a great belief in the sett. Wheal Agar shareholders will hold a meeting on the mine next Tuesday, and it is expected that the intentions of the executive will then be disclosed.

## LEGAL ANNOUNCEMENTS.

ANDREW ROBERT HAMMOND, deceased.—Pursuant to the Statute 22nd and 23rd Victoria, chapter 36, intitled "An Act to further amend the Law of Property, and to relieve Trustees," NOTICE IS HEREBY GIVEN, that all CREDITORS and other persons having any Debts, Claims, or Demands against the Estate of ANDREW ROBERT HAMMOND, late of Bulawayo, South Africa, but formerly of the City County and State of New York, in the United States of America, Mining Engineer, deceased, who died on the 29th day of March, 1896, and to whose Estate and Effects Letters of Administration were granted to Frederick Catesby Holland, of 20, Bishopsgate Street, in the City of London, Esquire, the lawful Attorney of Katherine Rath Hammond, the lawful widow and relict of the said deceased by the Principal Registry of the Probate Division of Her Majesty's High Court of Justice, on the 1st day of October, 1896, are hereby required to send particulars in writing of their Debts, Claims, or Demands to us, the undersigned, as Solicitors for the said Administrator, on or before the 10th day of April, 1897. And Notice is Hereby Given, that at the expiration of that time the said Administrator will proceed to distribute the Assets of the said deceased among the parties entitled thereto, having regard only to the Debts, Claims, and Demands of which he shall then have notice; and that he will not be liable for the Assets or any part thereof so distributed to any person or persons of whose Debt, Claim, or Demand he shall not then have had notice.

PALMER BLAND and NETTLESHIP,

4, Trafalgar Square, London, W.C.,

Solicitors for the said Administrator. ]

Dated this 19th day of October, 1896.



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 Examination of Mining Properties by Qualified Experts at a reasonable cost.  
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**GORDON WILSON, Esq.,** The Australian Gold Recovery Com-  
 pany (Limited), Charters Towers, North Queensland.

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 Camels to any part of the Eastern Gold Fields.

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 formerly Government Surveyor, South Australia.

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**Captain W. RICHARDS, formerly Underground Agent, West**  
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 Street, Truro.

# BRITISH SOUTH AFRICA COMPANY.

In issuing the annexed notice convening an extraordinary  
 general meeting of the Company, the directors desire to point out  
 that it is necessary to call the shareholders together in order that  
 their sanction may be given to further financial arrangements  
 rendered necessary by the heavy and largely increased expenses  
 incurred in connection with the rebellion that broke out in Rhodesia  
 in the spring of the present year, but which the directors are glad  
 to say, is now practically over, thanks to the bravery and energy  
 displayed by the settlers in Rhodesia, and to the splendid services  
 voluntarily rendered, at great personal peril, by Mr. Rhodes.

In addition to the rebellion, the Company has had to cope with a  
 most anxious and perilous condition of affairs, caused by a virulent  
 outbreak of rinderpest, involving the loss of literally hundreds of  
 thousands of oxen, many being killed by the disease, and many being  
 slaughtered in attempts to stay the progress of the plague.

Shareholders will appreciate how heavy in these circumstances  
 has been the drain upon the Company and its resources during the  
 present year. Although it is feared that the abnormal expense  
 thrown upon the Company is not yet over, it is believed that the  
 end can be seen and reliable estimates formed.

The half-million cash in hand, mentioned in the communication  
 issued by the Board to the shareholders under date the 10th Feb-  
 ruary last was soon exhausted, and in July last the directors were  
 compelled to create a mortgage debenture debt. An issue of  
 £1,250,000, bearing interest at 5 per cent. per annum, was suc-  
 cessfully effected at 97½ without any appeal to the public. This,  
 however, has not proved sufficient, for in addition to the outlays for  
 war, the administrator and other officers of the Company have been  
 compelled to make arrangements, at great expense, for provisioning  
 the country during the coming rainy season, the chief mode of  
 transport by ox wagon having failed in consequence of the cattle  
 plague.

The directors appeal confidently to their shareholders to support  
 them in the present situation, and to sanction the increase of the  
 capital of the company indicated in the annexed notice—namely,  
 by the creation of 1,000,000 additional ordinary shares of £1 each.  
 Pursuant to the policy adopted in the past the Board deprecates  
 creation of any preference or other special class of shares.

It is proposed to at once issue 500,000 of the new shares and to  
 invite the shareholders to subscribe for them *pro rata* at £2 per  
 share, a price somewhat below market value. Influential share-  
 holders have been consulted and approve the scheme. On their  
 advice underwriting arrangements have been made, and 300,000  
 of the half million shares have been underwritten at the issue price,  
 £2 (subject to the usual brokerage of 6d. per share), in consideration  
 of a call of 150,000 shares at £2 15s. per share until the end of  
 November, 1897. The capital thus to be raised will, it is calculated,  
 provide the balance of exceptional expenditure and meet the excess of  
 ordinary administration charges over revenue during the next  
 12 months with peace and a normal condition of affairs.

The confidence hitherto felt by the directors in the future of  
 Rhodesia has in no way been lessened by the recent unfortunate  
 events. These events have given a great impetus to railway enter-  
 prise, and it may now fairly be expected that the two railways—  
 the one from the east coast and the other from the south through  
 Bechuanaland—will meet between Salisbury and Bulawayo in a  
 very few years.

The Bechuanaland Railway, which is advancing rapidly from the  
 south, has now reached a point 140 miles from Mafeking, will near  
 Pekaia by the end of April next, and reach Bulawayo towards the  
 end of 1897.

The Beira Junction Railway Company, arranged for a through line  
 from the port of Beira on Fungwe Bay to Umtali (a few miles  
 beyond the anticipated Portuguese frontier), to be opened next  
 May, and negotiations are maturing for the immediate extension of  
 the railway to Salisbury.

Although the trial of Dr. Jameson and his officers, referred to in  
 the circular of the 10th February last, has been concluded, recent  
 events in South Africa are still to a certain extent sub-judice. The  
 directors will hold the ordinary general meeting of the Company  
 as soon as they can put the whole position before the shareholders.

By order,

HERBERT CANNING, Secretary.

15, St. Swithin's-lane, London, 27th October, 1896.

# BRITISH SOUTH AFRICA COMPANY.

Notice is Hereby Given that an EXTRAORDINARY  
 GENERAL MEETING of the SHAREHOLDERS of the BRITISH  
 SOUTH AFRICA COMPANY will be held in the Great Hall,  
 CANNON STREET HOTEL, Cannon Street, London, on FRIDAY,  
 the 6th November, 1896, at Noon precisely, for the purpose of  
 considering, and if deemed expedient, passing the subjoined resolu-  
 tion, and approving the arrangements referred to in the annexed  
 circular.

Notice is also Hereby Given that the SHARE TRANSFER  
 BOOKS of the Company will be CLOSED from Thursday, the  
 29th October, to Thursday, the 12th November, 1896, both days in-  
 clusive, and that the registration of all transfers received by the  
 Company on and after the 29th October, 1896, will be suspended  
 until Friday, the 13th November, 1896. While the books are thus  
 closed no transfers of shares will be "Certified."

Holders of share warrants to bearer wishing to attend the meeting  
 should deposit their share warrants pursuant to the conditions  
 endorsed thereon.

## RESOLUTION.

"That the capital of the Company be increased to £3,500,000,  
 by the creation of 1,000,000 new shares of £1 each."

Dated this 27th October, 1896.

By order of the Board,

HERBERT CANNING, Secretary.

15, St. Swithin's-lane, E.C., London.

# BRITISH SOUTH AFRICA COMPANY.

HOLDERS in ENGLAND of this Company's SHARE  
 WARRANTS to Bearer (not share certificates) are hereby notified  
 that they MUST DEPOSIT their share warrants with, or send by  
 registered post to, the Share Office of the Company, 2, Salter's  
 Hall Court, Cannon-street, London, E.C., on or before Friday, the  
 6th day of November, 1896, so that the allotment of new shares can  
 be made. The share warrants must be accompanied by a letter  
 giving the number of each share warrant (not the distinctive numbers  
 of the shares, which are not required) and the full names and address  
 of the holder.

HOLDERS of BEARERS SHARES residing out of the United  
 Kingdom MUST DEPOSIT their WARRANTS under the same  
 conditions with the Imperial Ottoman Bank, 7, Rue Meyerbeer,  
 Paris, on or before the same date—viz., the 6th November.

This notice does not refer in any way to holders of Registered  
 shares, either in the United Kingdom or abroad, as their names, of  
 course, appear upon the Company's Share Register.

## BARNATO BANK MINING AND ESTATE

### CORPORATION (LIMITED).

(IN LIQUIDATION).

NOTICE IS HEREBY GIVEN, that the Shareholders of above  
 are REQUESTED to DEPOSIT their OLD CERTIFICATES  
 on or after MONDAY, the 9th November, 1896, for exchange into  
 new Certificates of the Johannesburg Consolidated Investment  
 Company (Limited), or same will be forwarded by post on receipt  
 of the old Certificates.

By Order,

J. TUDHOPE,

Liquidator.

5, Lothbury, E.C., 30th October, 1896.

# The Mining Journal,

## RAILWAY & COMMERCIAL GAZETTE.

ESTABLISHED IN 1855.

THE MINING JOURNAL, RAILWAY AND COMMERCIAL  
 GAZETTE, published every SATURDAY MORNING, price  
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 dealing agency.

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 literary contributions should be addressed to "THE EDITOR." All  
 intended for insertion must be written on one side of the paper only. The  
 return of rejected manuscripts cannot be guaranteed. The Editor reserves  
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GERMANY: F. E. CLOTEN, Kommodorenstrasse 5, Köln a. Rh.

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18, FINCH LANE, LONDON, E.C.

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Codes used: "A.B.C.," "Morning's," and "Universal."

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LONDON: OCTOBER 31, 1896

## MINERAL STATISTICS OF THE UNITED KINGDOM.

THE Annual Blue Book of the Mineral Statistics of Great  
 Britain for the year 1895 has at last been issued from the  
 Home Office. This is, or ought always to be, a  
 publication of the greatest interest for all concerned, not only  
 in mining, but in almost any branch of trade or industry.  
 In the present case, however, such interest has been, to put it  
 mildly, somewhat tempered by the fact that these statistics  
 are just about nine months behind time, and that any indi-  
 vidual who wanted to know anything about the condition  
 of mining in this country, could have found out  
 all about them for himself months ago. The Home  
 Office might, perhaps, give as an excuse for the delay,  
 that its energies, as far as mining is concerned, were con-  
 centrated upon the new Coal Mines Regulation Act, which has  
 recently been passed, and which includes a number of curious  
 things, such as the regulation, for instance, that every "level"  
 met with in coal mining is to be mapped. Possibly the Home  
 Office is still busy calculating the scale of the colliery plans, that  
 will allow of this rule being adhered to, and of anything else  
 being visible at the same time. At any rate it is a pity that its



charges were so exhausted that the Home Office had to let three-fourths of the year go by before it could issue the Statistical Blue Book that ought to be forthcoming in the first quarter of each year. It is true that this year, for the first time, the mineral statistics include the output of quarries as well as of mines, so that the figures now published refer to minerals obtained from five different sources, namely:—

- 1.—Mines under the Coal Mines Regulation Act.
- 2.—Mines under the Metalliferous Mines Regulation Act.
- 3.—Quarries under the Quarries Act.
- 4.—Quarries less than 20 feet deep, not under the Quarries Act.

5.—Brine works.

Of the minerals raised under the heading No. 4, the majority are not, however, returned, only such substances as iron ores being included, and the production of the shallower clay pits, sand pits, gravel pits, chalk pits, &c., being omitted. There seems no reason in this; if chalk from a pit 21 feet deep is included in the returns, surely chalk from a pit 19 feet deep should also be. One is quite as much a mineral as the other, and quite as much a source of national wealth. On the other hand, we fail to see any sound reason for including the heaps of old slag, which are carried away for ballast, road metal, &c., in the mineral statistics. By no definition that we know can slag be considered to be a mineral. If a blast furnace manager chose to pile his pig iron in heaps 21 feet high, would it, too, become a mineral when removed? It scarcely should be, quite as much as the slag. Indeed, it is high time that we had a Home Office definition of the word "mineral." Ever since the delightful definition implied in the Quarries Act, which speaks of a quarry "as a place in which persons work in getting slate, stone, coprolites, or other minerals," and which reminds one of nothing so much as of the famous French Academy definition of the crab, as "a little red fish that runs sideways," it has seemed to us desirable that the Home Office should define what it means by a mineral, and now that it has added slag to the list of slate, &c., we are more anxious than ever to obtain such a definition, the weird elasticity of which appears to be positively fascinating. Is a brick 20 feet high a quarry, we wonder?

It will be apparent from what we have said that it is difficult to compare this year's with last year's figures, seeing that the substances included are not quite identical. For 1894, for instance, all the various kinds of stone were grouped together, and their value was estimated at close on £7,700,000; for this year (1895) quantities and values are returned in detail, and the total value comes to £3,725,000. In other words, there is every reason to suppose that the previous year's figure for the total value of our mineral production was too high by some £4,000,000 sterling, or about 5 per cent. of the total. For 1895 the total value of our mineral output is given as £69,129,864, being less than that of the year previous by about £8,770,000. Part of this deficiency is, as we have just shown, imaginary and not real. The greater part of the remainder is due to a heavy fall in the value of coal. The quantity of coal produced in 1895 is the greatest ever attained, being 189,661,362 tons; but, unfortunately, the price obtained for it is the lowest recorded so far, taking the average annual price in the London market as a standard. This price was 14s. 7d. in 1895, the next lowest figure being 14s. 9d. realised in 1886. The result of this low price is that the value of the above large output of coal is, roughly, £5,500,000 sterling less than the value of the 1894 output, although the latter quantity was less than the 1895 output by nearly 1,400,000 tons. It is hence abundantly clear that the shrinkage in value was a very serious one. The total value of the mineral production of the United Kingdom for the year 1895 being given as £69,129,864, the principal items that make up this total are: Coal, £57,231,213; iron ore, £2,865,709; and the various kinds of stone, slate, clay, &c., which together amount to about £9,033,000. These three items thus amount to close upon £69,000,000, leaving but little over £2,000,000 to represent the value of all the lead, zinc, copper, tin, and other metallic ores produced, together with a few such important substances as salt, oil, shale, &c., the value of which latter items exceeds £1,250,000. British metal mining is, therefore, in a dying condition, and though we all hope that the case may not be as desperate as it looks, it must be confessed that the figures before us give but scanty encouragement to the most ardent well wisher.

It is the more important, accordingly, that our colonies should year by year become better capable of supplying our home deficiencies, and we are glad to see that the importance of our colonial mineral outputs is recognised here by collecting them in the form of an appendix. It is difficult for us to understand, however, why these Colonial returns should be so far behind date as we find them. For instance, the mineral production for our Australasian Colonies is given not for 1895, but for 1894, although most of these colonies have issued their reports for 1895 months ago. If the Home Office is really incapable of getting these reports at first hand, we would respectfully venture to direct the attention of the authorities there to the columns of *The Mining Journal*, in which they will find far more recent returns of the mineral output of the colonies than is contained in the Blue Book before us.

We hope that this official publication will not fall into the hands of some of our Anglophobe French or German friends, for they will find evidence in it of an amount of territorial annexation which would alarm them as much as it surprises us. It is, for instance, interesting to find that in these tables of the "production of minerals and certain metals in the British colonies and possessions," the entire gold output of the Transvaal is included. At the same time the coal production of the South African Republic has not been added to that of the other British colonies. It surely would not be too much to ask that, in such a volume as the present, the export through a colony should be distinguished from its production. Again, we find returned under the head of Straits Settlements the entire tin output of the Protected Native States of the Malay Peninsula, together

with a footnote to the effect that the colony of the Straits Settlements comprises these States, that of the Sungai Ujong having, however, for some mysterious reason, been omitted from this paper annexation. We should like to know what the Sultan of Pahang has to say about it? The above are instances of ignorance, or more probably of carelessness, on the part of the compiler, to which we are fortunately not accustomed in our Governmental publications, and which can hardly, in the present instance, be excused on the score of undue haste in production.

## THE FUTURE OF DEEP LEVEL MINING ON THE RAND.

MANY causes are assigned by as many, who pose themselves as authorities, as responsible for the depression which is overshadowing the mining market, and the South African section of it in particular. Amongst these numerous causes many give, as one of the chief, the present feeling of uncertainty regarding the future of deep level mining. For our own part we do not think for a moment that this is a potent cause, but that it is an assistant cause cannot be gainsaid. Nevertheless, it must be confessed that a great deal of uncertainty does prevail as to the future of deep levels, and the strong faith in them, which only a short time ago was displayed by the major portion of the community, has received a severe blow from the failure of the Goldenhuis Deep crushings. We do not at all think that this uncertainty is justified by the apparent failure of this one particular mine, as it is no strong evidence whatever that the other deep level properties will turn out similar failures. Our opinion of the future of the Rand deep levels is well known, and has been given from time to time in most emphatic language, and that favourable opinion is supported by eminent experts, who have thoroughly studied the question. No doubt it will be within the recollection of our readers that in the article which we published at the time upon the unsatisfactory first crushing of the Goldenhuis Deep, we gave it as our opinion that where the outcrop company was not a rich one, it could scarcely be expected that the deep level would turn out exceptionally rich. This view is endorsed by so eminent an authority as Mr. J. A. CHALMERS, who, it will be remembered, is one of the authors of that well-known work, "Gold Mines of the Rand." We do not desire here to repeat what we have so frequently said, but it is interesting to lay before our readers a summary of the opinions held by this well-known engineer as to the future of deep level mining. That it would be a favourable one goes without saying, for this gentleman has argued at considerable length in his work to prove that its future is absolutely assured. Mr. CHALMERS has been interviewed by our esteemed and brilliant contemporary, the *Standard and Diggers' News*, and in that interview he gave expression to the unanswerable argument that even if it were an indisputable fact that the Goldenhuis Deep is never going to do more than pay mining expenses, this mine represents only about 1-25th of the longitudinal extent of that portion of the Rand which embraces profit-yielding concerns, and does not prove, therefore, that the results in all the other properties will be similar to those of this. Nor is the game up even with this company. But there is every probability that future crushings will see great improvements upon the first. But this significant fact must be taken into grave consideration, that the Goldenhuis Estate has always been a property of low grade ore, and it would only be reasonable to anticipate nothing but low grade returns from the deep levels of such properties. Mr. CHALMERS bases his faith in the future of the deep levels upon the facts that in the Robinson Deep shaft and the Rand Victoria and Beuzidenville bore holes, and the Durban-Rodepoort Deep (where the reef was recently intersected at a depth of 1300 feet 8 inches wide, assaying 3 ounces 2 dwts. per ton), there is sufficient evidence that the conglomerates extend 3000 to 6000 feet south of the outcrop, together with records of assays which, if they do not indicate rich returns, show at least in the majority of instances, reef sections of payable grade. As regards the continuance of the gold tenure of the reefs in depth, there is, on theoretical grounds, absolutely no reason to take a pessimistic view. Such are Mr. CHALMERS' views, and they are well worthy of grave consideration before people pass an ultimate judgment on the future of deep levels, and they should patiently await further evidence and further confirmation of failures such as those which attended the first crushings of the Goldenhuis Deep, before coming to any decided conclusions upon this vital question.

Further, we have the highly favourable report upon deep level mining from the pen of Professor BECKER, of the United States Geological Survey, which is quoted at some length in Mr. HAYS HAMMOND's report to the Consolidated Gold Fields of South Africa. As the report of the directors of this company did not reach us until a late hour yesterday, we are unable to publish extensive extracts from it, or to comment upon it at the length it deserves. We hope, however, to do the latter next week, prior to the holding of the annual general meeting. In the meantime, we would commend for consideration the following passage in that eminent experts' report, as it endorses not only our own views, but the opinions of those whose authority is of the greatest weight:—"It is very improbable that the ore of the deep mines in the region through which the Main Reef has been traced with certainty will show any general tendency to impoverishment dykes and faults will probably give less trouble in the deep mines than in the outcrop mines; there is no ground for fearing unmanageable quantities of water, or even very serious pumping expenses; and the temperature will increase more slowly than in most regions. There are, in my opinion, no insuperable natural obstacles to mining on the Witwatersrand at a depth of 4000 feet, and no known reason why, under favourable industrial conditions, the expense should exceed the present cost at 500 feet."

## MINING IN WEST AUSTRALIA.

AT a time when the West Australian market is to some extent under a—no doubt temporary—depression, it is cheering to take a rather larger view of the situation, and to point out the many pleasing contrasts which prevail between the actual position of the gold mining industry in the colony to-day, and what it was some months ago. Now that the auriferous capabilities of Coolgardie and the Murchison are accepted by nearly everyone as beyond question, there is a disposition abroad to forget the doubts and difficulties connected with the early days of the gold field, when everything bearing the West Australian brand was rejected almost with contumely by financiers nurtured on contemptuous references to the Cinderella of the fifth continent. Those—the minority—who were disposed to admit the existence there of payable gold manifested a tender regard for their reputation as critics by adding the qualification that it was patchy and intermittent. All this is now changed, and the present attitude of the public is far removed from alighting indifference and calm contempt. Even in the almost impossible eventuality of West Australia becoming on the whole a failure as a gold mining province, there is no chance of it ever recurring to its former low-water mark in general esteem. Everyone remembers a popular novelist's humorous description of a London district where people were respected and honoured according to the magnitude of their financial failures. Something of the same feeling would be excited by a Western Australian *débauché*, and if the colony, owing to the water difficulty and the unscrupulous conduct of light-headed company promoters, should not succeed in achieving a large measure of success, it will be at least entitled to the respect due to a great industrial bankrupt. This eventuality, however, is sufficiently remote to place it beyond the sphere of practical discussion and in the meanwhile all comparisons between the present condition of things in Western Australia, and that which ruled some months ago are, from the point of view of gold mining itself, undeniably better than they were. Some such contrast formed the text of a sparkling little speech which the Governor of Western Australia delivered recently when on a visit to Hannan's Reward. Sir GERARD, to do him justice, disdained to play the part of flatterer to the colony, and took care to mingle a little wholesome advice with his remarks. "There is no doubt in the world," he said, not obscurely, "that some of the ventures which have been floated are such as no reasonable man would go into, but I am coming to think that as a rule a large proportion of the mines, and even some of those floated as ventures, and for there is no need to mince matters, almost as frauds, even though contrary to the expectation of the people who floated them, have turned out good." Leaving aside the somewhat slovenly character of this pronouncement, it is a remarkable and candid condemnation of some few at least of the men who have woven connecting links between the London market and the West Australian gold field. It is, however, no condemnation of the class, but only of a few individuals who, as was well-known before the Governor spoke, are to be found in every branch of industry throughout the Globe. Sir GERARD's further remarks, in which he appealed to the company present to exert whatever influence they possessed against the flotation of worthless enterprises, should commend themselves to those who have the true interests of the colony at heart. The public are sufficiently uncharitable to compound one venture with another, and there can be little doubt that many a valuable enterprise and gold field has been injured and brought into bad odour because of a few worthless flotations. Not the least interesting portion of the proceedings, of which Sir GERARD SMITH's speech formed an important part, was the forecast which was made of the architectural and social future, which, in the eyes of the optimistic, lies before Hannan's. Some exaggeration probably lies in the expectation that the present corrugated iron structures and one storey hotels will, in the near future, be replaced by palaces in marble and mansions in granite. Not the less is there reason to anticipate a considerable material advancement in the conditions of life prevailing now at Hannan's, and the record progress of Johannesburg will, at least, be challenged, if not broken, by the colonial town.

## WAITEKAURI GOLD MINING COMPANY.

THE full report, covering 15 months' operations, which the directors of the Waitekauri Gold Mining Company have just issued, should give abundant satisfaction and encouragement to the shareholders, and notwithstanding the depression which is overshadowing the whole of the mining market, should prevail upon them to look forward to the future with a considerable degree of hope. This depression, it must be confessed, affects the New Zealand section the least, and with justification, for it is a gold field upon whose future absolute reliance can be placed, and which, as we have frequently observed, possesses abundant resources for economical working. In a very short space of time some of the colony's mines have achieved wonders, and are properties of rare promise. Though it has not yet rivalled the deeds of its neighbours, the Waitekauri Gold Mining Company owns a property from which a great deal may be expected. Having been incorporated so recently as May, 1895, it has not yet achieved anything exceptional, the work done having been entirely connected with the opening up of the mines, building tramways, water races and a large mill of 40 heads. Nevertheless, during this necessary work of development, plenty of evidence has been forthcoming showing the promising richness of the reefs in various sections of the property. For instance, 2511 tons of ore from the Golden Cross Reef were treated, yielding bullion of the value of £13,335 8s. 3d. From the Komata section 95 tons were crushed for a yield of £524 6s. 6d. A further sum of £1473 10s. 11d. accrued from tailings from the old Komata mill, making a total realised from bullion of £15,333 5s. 8d. After allowing 30s. per ton for mining and milling this bullion, the net amount, £11,424 5s. 8d.,



with sundry receipts amounting altogether to £12,870 2s. 6d., has been carried to reserve account. This is a result, which, it must be confessed, has not come up to expectations, but during the year the company has suffered from rather severe troubles, which accounts in a chief measure for the disappointment. For instance, in June last, a rain storm of unusual severity occurred in the Waitakauri district, preventing the new mill from working until the damage done by the storm had been repaired. Then again there has been a great scarcity of skilled and competent mill hands, and these obstacles the directors estimate have curtailed the expected gold returns by a sum of at least £15,000. Notwithstanding this, however, the financial results of the 15 months' working, may, as we have already pointed out, be recorded as satisfactory, and the shareholders are likely to rejoice over the fact that it will enable the directors next month to pay a first interim dividend of 1s. per share. The principal section of the company's property is called the Golden Cross Section, which was formerly owned and partially developed by the Golden Cross Mining Company. It is about 100 acres in extent. The special feature of this part of the property is the Golden Cross reef, which as far as it has been opened out shows very promising indications. There are now three separate runs of gold in the reef in this section, and to avoid mistake they will, in future, be distinguished by separate names. The run of gold in Corbett's level will in future be known and referred to as the "main run." The ore taken from the drives, rises, and stopes within this distance from March 1, 1895, to May 31, 1896, amounted to 2511 tons, which yielded £38,335, an average yield of £5 6s. 2d. per ton. The next section in point of importance is the Komata section, the workings on which are about 8000 feet distance from the gold fields of the Golden Cross section. Here the developing work is being pushed on vigorously, and seeing that it yielded large returns to the late owners, it is most probable that it will turn out a rich and promising part of the property.

### A RECORD PIG IRON OUTPUT.

GENERAL satisfaction throughout the iron trade is being expressed at the statistics just published by the British Iron Trade Association regarding the pig iron output for the first half of 1896; and when it is considered that they were over 15 per cent. better than last year, and that, in fact, they established the best half-year in the history of the trade, there can be little wonder at the manner in which they have been received. It appears that the output amounted to 4,328,444 tons, which is at the rate of 8,656,888 tons a year. The greatest output previously recorded for a single year was 8,493,237 tons in 1882. The increase which characterises the new total has been distributed all over the principal districts. Cleveland has risen from 1,457,672 tons to 1,600,960 tons; Scotland from 430,380 to 620,000 tons; and Cumberland from 307,936 tons to 352,059 tons. The output of pig iron and steel purposes respectively is now closely approximative, as will be seen from the following analysis of the aggregate make, the latter class having gradually been creeping up:—Of the total make of 4,328,444 tons, forge and foundry are responsible for 2,054,552 tons, and hematite and basic for 2,127,184 tons; whilst speigelleisen, ferro-manganese, chrome, and silicon iron are responsible for 146,708 tons. The circumstance that the furnaces in blast during the first half of the year were 359, which is an increase of only 15 upon those in blast during the year 1895, shows, in conjunction with the enormously increased make, that higher pressures are being used. If we extend the comparison back a period of 14 years we find we are now producing a much larger quantity than then with 211 furnaces less. Evidently not only are higher pressures being used, but the tendency to build furnaces of greater dimensions—more, in fact, after the American shape—is a growing one. Stocks were low at the end of the half-year, and are still lower now. The quantity of coal used per ton of pig iron produced has greatly declined of late years; so much so, that the consumption of coal required to produce 7,703,459 tons of pig iron in 1895 was only 15,224,517 tons, whilst in 1873 it needed 16,718,632 tons of coal for a production of 6,566,457 tons of pig iron.

### JOHANNESBURG CONSOLIDATED INVESTMENT COMPANY.

ALLOWANCE being made for the adverse conditions, political and other, which have affected commercial and industrial progress in South Africa during the past 12 months, the report and balance-sheet recently issued by the directors of the Johannesburg Consolidated Investment Company (Limited) will probably be generally regarded as highly satisfactory in character. The main results following the recent working of the company are, no doubt, by this time well known in financial circles. In December, 1895, an interim dividend at the rate of 30 per cent. per annum was paid, while the directors have since declared a further dividend of 20 per cent. per annum. These dividends absorbed together £199,500, leaving to be carried forward a balance of £331,686. Wisely, in our opinion, the directors have decided to place £250,000 to a separate reserve fund for the purpose of equalising dividends and placing them to some extent beyond the reach of those temporary influences which produce little or no effect upon permanent market conditions, but are all powerful while they last. The special conditions by which the company, in common with all other South African enterprises, was hampered during the period covered by the report are, it is said, now no longer operative, so that for the year now in progress better results may be anticipated. The board are, in fact, remarkably hopeful regarding the future of the company, and point to the expansion of the business in the past as a reliable indication of further progress in the time to come. The company's business, in their opinion, is capable of considerable further development, and with this view the constitution of the company is being in certain particulars strengthened.

### BORES AND BOERS.

PEOPLE with whom the greed for gold has not altogether stifled the voice of patriotism will agree that it is time to enter something of a protest against the growing disposition in certain wealthy quarters to indulge in cheap joers at JAMESON and his gallant little band, who, under a mistaken notion of humanitarian expediency, threw themselves against a superior force of Boers in hiding. It is wonderful with how little wit and ingenuity a man may pass for a humorist with the average English audience, whose perception is not generally keen enough to distinguish between delicate shades of meaning and sentiment. But the grotesque indecency of the clumsy gibes against JAMESON and his fellow Britons which occasionally fall from English lips at company meetings is something which can hardly escape recognition. A verbose and circumlocutory speaker recently—with the indescribable air of a man giving utterance to a luscious witticism—deplored the attempt of the doctor "to steal a republic." It is true that he failed to draw even gallery laughter, and was subsequently assailed with acrid criticism on the score of an unsatisfactory balance-sheet; but the fact that such a remark could be made with impunity before an English audience would seem to suggest that as a people we are retrograding—at least in point of patriotism—which was formerly esteemed not the least of the cardinal virtues. These unpatriotic speakers are generally the dullest men alive, so that on two grounds—those of national pride and the character of public oratory—it would be well if public opinion compelled them to hold their peace.

### A WARNING.

OUR contemporary, the *Montan Zeitung*, publishes an article, warning English capitalists against taking up certain petroleum concessions in Hungary, and which are about to be placed upon the London market. "It is known," our contemporary observes, "that there are some petroleum fields on the slopes of the Carpathians, in Transylvania, and which have an immediate connection with the petroleum fields of Roumania. These fields have belonged for some years to a certain firm who have made soundings and sunk wells in which the oil has been found. These discoveries have attracted the attention of a certain merchant of Budapest, who has hastened to secure some land near this property, with permission to exploit other land not conceded to him. But as the former people have secured for themselves all the fields which carry petroleum, the latter can only obtain land which does not contain the oil. Judging from the communications which have reached us from London and Paris, this enterprising gentleman is offering his property in these places, where he is exhibiting samples of the petroleum which has been taken from the wells sunk on the property owned by the older firm. In order, therefore, to preserve the petroleum industry of Hungary, it is necessary to publish this fact, in order that capitalists may not be induced to spend money on valueless land." This is the purport of the article in the *Montan Zeitung*, and we quote it for the benefit of our readers. Our contemporary may or may not be misled, and, in the absence of further confirmation, we give it for what it is worth.

### REVIEW.

*L'Art de faire de l'or.* By Théodore Tiffereau. Paris, 1894.

We have received a copy of this amusing little pamphlet, the subject of which is best defined by its sub-title, "The Transmutation of Iron, Copper, and Silver into Gold; an unanswerable proof based on an undeniable positive fact." We wish to refer to this production, mainly because we are only too glad when we can lay anything before our readers that is likely to amuse them, and to lighten the somewhat heavy array of facts and figures perforce presented by our columns. M. Tiffereau, who was, it seems, at one time chemical assistant at Nantes, has been working for 40 years at the manufacture of gold. Once during that period it seems that he was successful. This fortunate occurrence took place at Guadalajara in Mexico, where the following experiment was performed:—M. Tiffereau exposed pure nitric acid to the sun for two days, and then threw into it 10 grammes of filings of an alloy of copper and silver in the proportion in which these metals exist in coin. An evolution of gas took place, and the reaction was allowed to continue for 17 days. At the end of this time he evaporated to dryness, and treated the residue repeatedly with pure boiling nitric acid. The substance changed colour gradually from greenish black to bright green, then to pale yellow, and finally became bright golden yellow. This residue was carefully analysed by M. Itasse, a distinguished chemist, who found it to be identical with natural gold, and to contain only a little silver. On coming to Paris and repeating his experiments, M. Tiffereau failed to obtain gold, but the reason of his failure was at once clear to a scientist of his acumen. At Guadalajara, in the midst of the mining districts of Mexico, the gold microbes, which generate the precious metals, of course abound, and these microbes would equally, of course, flourish in his concentrated nitric acid, and transmute M. Tiffereau's silver into gold. Unfortunately, these microbes of the precious metals do not seem to exist in the ordinary atmosphere of Paris; the likeliest place for them would be the Mint, but the director of the Paris Mint, with almost incredible brutality, actually refused to allow M. Tiffereau to carry on his researches at that establishment. Verily, the ways of the alchemist are hard in the 19th century.

Our readers, however, will now know what to do. Let them sell their Robinson and Mysore shares, and start off for Mexico (we do not know as yet whether the gold microbe exists in other places) armed with a microscope and a bottle of strong nitric acid. As soon as they have caught a sufficient family of gold microbes, let them come back and start a gold farm, and grow as much gold as they want, not forgetting, of course, to set aside a ton or two for a golden statue to M. Théodore Tiffereau, the discoverer of the *bacillocooccus aurificator*.

THE share transfer books of the Great Boulder Proprietary Gold Mines (Limited) will be closed from November 10 to November 20 inclusive, for payment on the latter date of an interim dividend of 5s. per share, free of income tax.

THE DE LAMAR MINING COMPANY (LIMITED).—Dividend warrants for the 21st dividend of 1s. per share (free of income tax) have been posted to all shareholders registered on the company's books on October 3.

## THE MINING MARKET.

FRIDAY EVENING.  
The Settlement completed without failures.—A heavy break in Kaffirs demoralises the entire market.

FOR the first time in the annals of the Mining Market the Committee of the Stock Exchange undertook, in connection with the settlement just concluded, an official list of making-up prices. Hitherto the decision as to prices at which mining shares were "struck" on account days had been in the hands of one or two of the leading jobbers in each section. Although it would not be fair to write in universal condemnation of the manner in which these duties had been discharged, there is no doubt that good grounds for dissatisfaction existed, more particularly in what may be called the "one-eyed" markets. The dealer in command here was only too prone to fix his making-up prices so as to suit his own book. If he was a bull the making-up price was unduly high; if, on the other hand—and this was the more frequent case—he happened to be a bear the unfortunate public found their differences proportionately higher. It is at any rate a step in the right direction to have the control vested in the official hands. The more recognition that the Mining Market can secure from the powers that be, the better will the interests of the public be safeguarded.

Unfortunately there is little enough of improvement to report in the condition of Stock Exchange business generally, and of that department of it in which we are most interested in particular. Another Settlement has come and gone, and up to the time of writing no failures amongst members of the House have been reported. But despite this freedom from open default, there has been a disturbing amount of forced liquidation. Although the week bull element has been thinned out week after week, and the speculative account has become compressed within the most moderate dimensions, there seems to be no end to the realisations that are pressed upon the market. Where they come from is kept a profound secret, and the mystery is responsible for rumours of the wildest nature. Ostensibly Paris is the centre of the trouble, but there are grounds for believing that orders are sent from the French capital to conceal the real venue of the trouble. The market to-day has been in a state of open demoralisation, and the bears have had everything their own way. They would have us believe that Deep Level mining is an acknowledged failure, and such a suggestion, although unconfirmed though it is, would appear to be the ruling factor in the situation.

When we last wrote the West Australian market had just been the scene of a determined bear raid. Saturday, which was the last dealing day for the end October account passed off without any special feature. Dealings were chiefly in the direction of getting books even, the bears of the preceding day evincing some desire to buy back. The net result was a firmer tone towards the close, with hopeful expressions as to a turn for the better next week. It was rightly argued that the account was very much reduced, and that no trouble was to be anticipated with regard to the carrying-over arrangements. These anticipations were realised on Monday, when despite the rise in the Bank rate to 4 per cent. Contango rates were, if anything, rather lighter than at the preceding settlement. In special instances, where stocks had been selected for strong attack operators for the rise were enabled to continue their bargains even. On the whole the carry over was effected without difficulty, but Kaffirs were dull in the afternoon, though Westralians were inclined to improve. There was a firm tone in New Zealand shares, but otherwise the Miscellaneous department was featureless. Things were quietly uneventful on Tuesday, which was making-up day for the general market. On Wednesday the Kaffir market was uncomprehendingly flat, the Gold Fields group suffering some heavy declines. On the whole, the West Australian section displayed resistance to the weakening influences with which it was surrounded, and business in the miscellaneous corner was neglected. Thursday was pay day, and, as all ready states, no open defaults occurred. Throughout the day, however, an uneasy feeling was evident, and Kaffir prices sagged away until the last half hour, when there was some rally on bears closing. Westralians kept fairly steady, though it was more because the market was left alone than that it obtained any special support. To-day Kaffirs opened dull, and broke away at once, losing ground hour by hour without the semblance of a rally. The general story afloat was that the Gold Fields report would justify all the selling. This did not make its appearance till too late in the day to have any palpable effect, and the closing was generally at the worst.

### South Africans.

The making-up on Monday disclosed the fact that the open account in Kaffirs was reduced to dimensions that may be regarded as moderate even as gauged by present conditions. The general rate was 7 or 8 per cent., but Johannesburg Investments went over even owing to sales on behalf of holders of Barnato Bank shares, made in anticipation of the forthcoming distribution in exchange for their present holdings. The rate on Chartered opened at 3d., but increased later on to nearly 2d. On Gold Fields the charge was about 4 per cent. at first, but this increased later, whilst on East Rand a contango of 6 per cent. went off all together in the later dealings. Chartered were alleged to be in short supply owing to sales on the part of capitalists who have underwritten the new issue at £3 per share. By the way, the meeting authorising the increase of capital is summoned for Friday next. The terms of the issue are, as already stated, existing shareholders having the right to take up at £2 one share for each five of their present holding. Chartered, which we left at 2½, hardly moved until Wednesday, when they lost a small fraction. They have been flat again to-day, closing ½ down at 2½. Despite semi-official details, which were maintained up to the last moment, there is to be a new issue of East Rand capital after all. A meeting will be held in Johannesburg on December 14 to discuss the proposal for increasing the capital by 100,000 shares, to be issued at £4 10s., at which price they have been guaranteed. East Rand made up on Monday at 5½, but went flat directly afterwards, and on Tuesday [have been always under 5. They have fallen quite 10s. to-day, and are finally ½ down at 4½. Comets at 1½, and St. Angelo at 3½ are both about half a point lower. The report of the directors of the Consolidated Goldfields, which has served as chief bugbear to the market, did not make its appearance until after official hours to-night. We give a brief glance that we have been enabled to bestow upon its contents gives us the impression that it is by no means the discouraging document the bears would have us believe. Nevertheless, selling of the Deferred shares has been most persistent throughout the week, and is reaching its climax to-day, when the shares lost over £1. At 6½ the price is finally just a couple of points to the bad on the week.



## THE METAL MARKETS.

		Aluminum		Per lb.		Per lb.	
0.00% per cent.	...	...	...	0 1 4	...	0 1 4	...
		Nickel					
0.00 per cent. guaranteed	...	...	...	0 1 2	...	0 1 4	...



# "THE MINING JOURNAL" SHARE LIST.

REVISIONS AND REFERENCES.—The following are the significations of the abbreviations and references which occur in the Share List:—A, Antimony; Ar, Arsenic; B, Bismuth; Br, Borax; C, Copper; D, Diamond; G, Gold; I, Iron; L, Lead; M, Manganese; N, Nitrate; P, Phosphate; Q, Quicksilver; R, Ruby; S, Silver; S-L, Silver-lead; Sul, Sulphur; T, Tin; and Z, Zinc. \* In the "Amount of Share" column of British Mines signifies that the mine is conducted on "Cost Book" principles; † in the "Head Office" column of African Mines signifies that the address given is not that of the head office but of a sub, or transfer office; and ‡ in the "Name" column of African Mines, signifies that they are subject to the Limited Liability Law of the South African Republic.

\* The following is by far the most complete and comprehensive list of mines, in whose shares business is being currently transacted, published. Additions will be made from time to time as occasion requires. Every effort is made to ensure accuracy, and Secretaries of Companies, Share Dealers, and our readers generally, are cordially invited to co-operate with us to this end, by notifying us of any errors that may at any time occur. We desire to be understood that while our Share List will almost invariably be found correct, we do not hold ourselves responsible for any loss or inconvenience that may arise from possible inaccuracies.

## AFRICAN MINES.

Name.	Closing Price, Oct. 30, 1898.	Closing Price Oct. 23, 1898.	Am't. of Share	When last X'd and Dividend.	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office.
Abbott's Con. Reefs	1/8 1/8	1/8 1/8	1 0	—	1 0 0	25,000	De Kaap	1, Moorgate place.
Adler Consolidated	1/8 1/8	1/8 1/8	1 0	2/ Oct. 15, '98	1 0 0	436,000	De Kaap	3, Cophall-buildings
African Estates	1/8 1/8	1/8 1/8	1 0	2/ Oct. 15, '98	1 0 0	175,000	De Kaap	23, College Hill.
Gold Revy.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	—	—	—
Afrander	1/8 1/8	1/8 1/8	1 0	2/ Oct. 15, '98	1 0 0	40,000	Transvaal.	33, College Hill
Alexandra Estate G	1/8 1/8	1/8 1/8	1 0	—	1 0 0	225,000	Hand	16, George street
Angelo	1/8 1/8	1/8 1/8	1 0	—	1 0 0	175,000	Hand	Winchester House
Anglo-French Exp.	1/8 1/8	1/8 1/8	1 0	3/- Sept. 30 '98	1 0 0	30,300	S. Africa	3, Princes street
Matabeland	1/8 1/8	1/8 1/8	1 0	—	1 0 0	39,750	Matabeland	Winchester House.
Appantoo	1/8 1/8	1/8 1/8	1 0	—	1 0 0	77,885	West Coast	Dashwood House.
Aurora	1/8 1/8	1/8 1/8	1 0	5% Mar. '93	1 0 0	65,000	Hand	8, Old Jewry.
West United.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	100,000	Hand	7, Lothbury
Baile's Estate G	1/8 1/8	1/8 1/8	1 0	—	1 0 0	520,000	Transvaal	85, Gracechurch-st.
Land	1/8 1/8	1/8 1/8	1 0	1/ Feb. 13, '98	1 0 0	520,000	Hand	15, Geo. St., M. Ho.
Easton's Consol. G	1/8 1/8	1/8 1/8	1 0	2/ Feb. 24 '98	1 0 0	83,000	Hand	—
Barnet Consol	1/8 1/8	1/8 1/8	1 0	—	1 0 0	1,000,000	De Kaap	7, Lothbury.
Barr. & Co.	10/ 11/	10/ 11/	10/	—	0 9 0	207,496	De Kaap	17, Basinghall-street
Bechuanaand Exp.	1/8 1/8	1/8 1/8	1 0	2/ Feb. 24 '98	1 0 0	400,000	Bechuana.	19, St. Swithin's-lane
Trad. G. Assoc.	1/8 1/8	1/8 1/8	1 0	1/6 July 15, '98	0 10 0	91,307	Hand	72, Basinghall street
Big Golden Quarry	1/8 1/8	1/8 1/8	1 0	—	0 8 0	483,228	Kaap Rivr	Warnford Court.
Block "B" Lang.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	535,000	Hand	8, Princes-st., E.C.1
Bonanza	1/8 1/8	1/8 1/8	1 0	—	1 0 0	2,000	Turfmont	120, Bishopgate-st.
Brit. S. A. Char.	1/8 1/8	1/8 1/8	1 0	2/ Feb. 24 '98	1 0 0	1,999,750	S. Africa	15, St. Swithin's-lane
Buffalo Consol. G	1/8 1/8	1/8 1/8	1 0	16/- Nov. 28 '98	1 0 0	250,000	Potchefst.	7, Lothbury
Central	1/8 1/8	1/8 1/8	1 0	—	1 0 0	—	Hand	8, Old Jewry
Consolidated	1/8 1/8	1/8 1/8	1 0	—	1 0 0	225,000	Hand	Warnford Court
Cape Asbestos	1/8 1/8	1/8 1/8	1 0	—	1 0 0	50,211	Orange Riv	13, St. Swithin's-lane
Copper	1/8 1/8	1/8 1/8	1 0	2/ June 12, '98	2 0 0	300,000	Cape Col.	9, Queen-street-place.
C. & F. Ref.	1/8 1/8	1/8 1/8	1 0	2/ June 12, '98	2 0 0	45,000	Hand	83, Cannon-street.
Cassell Consol.	1/8 1/8	1/8 1/8	1 0	1/5 Oct. 29 '98	1 0 0	75,000	Johannesb.	Palmerston Bldgs
Cen. de Kaap	1/8 1/8	1/8 1/8	1 0	—	1 0 0	240,000	De Kaap	126, Bishopgate-st.
Reedy's Deep	1/8 1/8	1/8 1/8	1 0	—	1 0 0	240,000	Hand	—
Champ d'Or	1/8 1/8	1/8 1/8	1 0	3/2 Feb. 27 '98	1 0 0	115,015	Hand	8, Old Jewry, E.C.
Charterland G.F.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	150,000	Hand	15, St. Swithin's-lane
Chinese West	1/8 1/8	1/8 1/8	1 0	—	1 0 0	150,000	Hand	Winchester Ho.
City and Sub. N.W.G	1/8 1/8	1/8 1/8	1 0	2/ Oct. 29, '98	4 0 0	340,000	Hand	Gresham Ho.
Cons. Buffaloland	1/8 1/8	1/8 1/8	1 0	9/ July 15, '98	1 0 0	721,500	Grigulid	62, Lombard-st.
Cons. Deep Levels G	1/8 1/8	1/8 1/8	1 0	6/ Oct. 29, '98	1 0 0	187,500	Transvaal	30, St. Swithin's-lane
Cons. G. Fields & A.	1/8 1/8	1/8 1/8	1 0	10/ May 1 '98	1 0 0	1,250,000	S. Africa	8, Old Jewry
Do. S. & F. Ref.	1/8 1/8	1/8 1/8	1 0	1/5 Oct. 29 '98	1 0 0	1,249,999	Hand	—
Do. S. & F. Deben.	1/8 1/8	1/8 1/8	1 0	5% July 1, '98	5 0 0	60,000	Hand	—
Crown Deep	1/8 1/8	1/8 1/8	1 0	—	1 0 0	250,000	Hand	120, Bishopgate-st.
De Kaap	1/8 1/8	1/8 1/8	1 0	12/ Oct. 29, '98	1 0 0	120,000	Hand	—
De Kaap Consol. D	1/8 1/8	1/8 1/8	1 0	12/ July 15 '98	5 0 0	799,791	Kimberley	62, Lombard-street.
Do. S. & F. Deb.	1/8 1/8	1/8 1/8	1 0	5% July 1 '98	1 0 0	635,000	Hand	—
Do. S. & F. Bul. Ob.	1/8 1/8	1/8 1/8	1 0	4% Oct. 1, '98	1 0 0	472,000	Hand	—
Doornkop	1/8 1/8	1/8 1/8	1 0	—	1 0 0	250,000	Doornkop	Warnford Court
Driefontein	1/8 1/8	1/8 1/8	1 0	—	1 0 0	175,000	Hand	Winchester Ho.
Durban Deep	1/8 1/8	1/8 1/8	1 0	3/- Sept. 16 '98	1 0 0	412,000	Hand	23, Leadenhall-bldg.
Eastleigh	1/8 1/8	1/8 1/8	1 0	—	1 0 0	240,000	Klerksdorp	57, Leadenhall Street
Easton	1/8 1/8	1/8 1/8	1 0	—	1 0 0	275,000	Hand	8, Old Jewry
Easton Consol.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	570,000	Hand	170, Winchester-ho.
Exploration	1/8 1/8	1/8 1/8	1 0	—	1 0 0	140,000	S. Africa	30, St. Swithin's-lane
Exploring L & M.	1/8 1/8	1/8 1/8	1 0	2/ Dec. 16, '98	1 0 0	215,215	Hand	19, —
Ferris	1/8 1/8	1/8 1/8	1 0	25/ Aug. 28 '98	1 0 0	45,000	Hand	120, Bishopgate-st. Wn.
French Hand	1/8 1/8	1/8 1/8	1 0	—	1 0 0	485,000	Hand	28, Austin Friars.
Golden Deep G	1/8 1/8	1/8 1/8	1 0	—	1 0 0	265,000	Transvaal	30, St. Swithin's-lane
Golden Deep G	1/8 1/8	1/8 1/8	1 0	2/ Oct. 29 '98	1 0 0	187,500	Hand	120, Bishopgate-st. Wn.
Main Reef	1/8 1/8	1/8 1/8	1 0	2/ Feb. 13 '98	1 0 0	150,000	Hand	Warnford Court, E.C.
George's Reef	1/8 1/8	1/8 1/8	1 0	—	1 0 0	100,000	Driefont.	Johannesburg.
Glenberg New	1/8 1/8	1/8 1/8	1 0	—	1 0 0	130,000	Hand	Warnford Court, E.C.
Glencairn	1/8 1/8	1/8 1/8	1 0	—	1 0 0	200,000	Hand	2, Drapers-gardens.
Golden Dove	1/8 1/8	1/8 1/8	1 0	—	1 0 0	50,000	Natal	65, Chancery Lane.
Gld. Fie. Deep	1/8 1/8	1/8 1/8	1 0	—	1 0 0	600,000	S. Africa	8, Old Jewry.
G.F. of Lydenburg	1/8 1/8	1/8 1/8	1 0	—	1 0 0	200,000	Lydenburg	7, Lothbury.
G.F. of Mashonaland	1/8 1/8	1/8 1/8	1 0	—	1 0 0	200,000	Mashonaland	19, St. Swithin's-lane.
Grassop	1/8 1/8	1/8 1/8	1 0	—	1 0 0	400,000	Lydenburg	2, Tokenhouse Bldg.
Gr. Kat. Colliery	1/8 1/8	1/8 1/8	1 0	—	1 0 0	376,666	Grootel	Graham House.
Grigulid W.	1/8 1/8	1/8 1/8	1 0	1/ July 15, '98	10 0 0	105,700	Transvaal	62, Lombard-street
Heidelberg, Est. Ex.	1/8 1/8	1/8 1/8	1 0	—	—	—	Heidelberg	—
Henderson's Trans	1/8 1/8	1/8 1/8	1 0	—	1 0 0	250,000	Hand	85, Gracechurch-st.
Henry House	1/8 1/8	1/8 1/8	1 0	—	1 0 0	180,000	De Kaap	Warnford-court.
Hetty	1/8 1/8	1/8 1/8	1 0	—	1 0 0	110,000	Middlevel.	55, Bishopgate-st Wn
Joe's Reef	1/8 1/8	1/8 1/8	1 0	—	1 0 0	57,404	Hand	21, Mining Lane.
J'd's Con. Invt. (N)	1/8 1/8	1/8 1/8	1 0	1/ Sep. 30, '98	1 0 0	650,000	Hand	7, Lothbury.
Pioneer	1/8 1/8	1/8 1/8	1 0	8/ Oct. 15, '98	1 0 0	21,000	Hand	Johannesburg.
Jubilee	1/8 1/8	1/8 1/8	1 0	4/ Oct. 29 '98	1 0 0	30,000	Hand	8, Old Jewry
Jumpers	1/8 1/8	1/8 1/8	1 0	6/ Mar. 27 '98	1 0 0	100,000	Hand	120, Bishopgate-st. Wn.
Deep	1/8 1/8	1/8 1/8	1 0	—	1 0 0	300,000	Hand	30, S. Swithin's lane
Kimberley	1/8 1/8	1/8 1/8	1 0	1/ June 18, '98	0 10 0	98,672	Kimberley	15, Finsbury circus
Reef	1/8 1/8	1/8 1/8	1 0	—	1 0 0	125,000	Hand	2, Drapers-gardens
Kleinfont. In Can.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	225,000	E. Hand	Winchester House
Klerksdorp	1/8 1/8	1/8 1/8	1 0	—	0 10 0	400,000	Klerksdorp	110, Cannon St.
Knight's Deep	1/8 1/8	1/8 1/8	1 0	—	1 0 0	295,194	Hand	8, Old Jewry
Kofffontein	1/8 1/8	1/8 1/8	1 0	—	1 0 0	135,000	Jacobadai	6, St. Helen's.
Lancaster	1/8 1/8	1/8 1/8	1 0	—	1 0 0	225,000	Hand	120, Bishopgate-st. Wn.
Langlaagte Est. G	1/8 1/8	1/8 1/8	1 0	3/ July 20 '98	1 0 0	470,000	Hand	50, Holborn Viaduct
Langlaagte Est. G	1/8 1/8	1/8 1/8	1 0	—	1 0 0	100,000	Hand	2, Drapers-gardens.
Star	1/8 1/8	1/8 1/8	1 0	—	1 0 0	170,000	Hand	—
Lisbon-Berlyn	1/8 1/8	1/8 1/8	1 0	—	0 2 6	289,233	Lydenburg	8, Suffolk House.
Lon. Paris Fin & M.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	500,000	S. Africa	53, Old Broad Street
London & B. A. Ex.	1/8 1/8	1/8 1/8	1 0	4/- Sept. 3 '98	0 10 0	100,000	Hand	19, Finsbury-circus.
Luisburg Estate	1/8 1/8	1/8 1/8	1 0	—	1 0 0	315,000	Hand	Warnford-court.
L. & Exp.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	190,000	Lydenburg	85, Gracech. Street
M.G. Est.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	200,000	Hand	120, Bishopgate St.
Main Reef (New) G	1/8 1/8	1/8 1/8	1 0	—	1 0 0	111,500	Hand	15, George St., M. H.
Malmesbury Gold Syn	1/8 1/8	1/8 1/8	1 0	—	0 2 6	200,000	Transvaal	Throgmorton House
Marie Louise	1/8 1/8	1/8 1/8	1 0	—	1 0 0	250,000	Hand	15, George St., M. H.
Marivaal Nigel	1/8 1/8	1/8 1/8	1 0	—	1 0 0	150,000	Mashonaland	8, Old Jewry, E.C.
Mashon. Agency	1/8 1/8	1/8 1/8	1 0	—	1 0 0	100,000	Hand	—
Central	1/8 1/8	1/8 1/8	1 0	—	1 0 0	110,000	Matabeland	3, Cophall-buildings
Matabeland G. R. I	1/8 1/8	1/8 1/8	1 0	—	1 0 0	236,502	Hand	4, Lothbury.
May Con. (New) G	1/8 1/8	1/8 1/8	1 0	1/ Feb. 13 '98	1 0 0	75,000	Hand	1, Crosby Square.
Meyer & Charl.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	150,000	Hand	Winchester House.
Minerva	1/8 1/8	1/8 1/8	1 0	—	1 0 0	100,000	Hand	33, Br'd St. Avenue.
Mine Selection	1/8 1/8	1/8 1/8	1 0	—	1 0 0	100,000	Hand	15, George Street
Modderfont. G	1/8 1/8	1/8 1/8	1 0	—	1 0 0	325,000	Hand	28, Austin Friars
M. & E. Est.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	240,000	Modderfont	120, Bishopgate-st
Molybdenum Consol.	1/8 1/8	1/8 1/8	1 0	—	1 0 0	240,000	S. E. Africa	Graham House.
Moodies	1/8 1/8	1/8 1/8	1 0	—	1 0 0	40,000	Hand	13, Austin Friars.
Mossambique	1/8 1/8	1/8 1/8	1 0	—	1 0 0	40,000	Hand	—
Mamaquid	1/8 1/8	1/8 1/8	1 0	—	1 0 0	94,321	Mamaquid	54, Leadenhall-bldg.
New Africa	1/8 1/8	1/8 1/8	1 0	—</				



Anglo-Chilian F/V	5 1/4	5 1/4	8 1/4	8 1/4	10 0	7/0 Feb. 27 '96	10 0 0	35,000	Antofagast.	123, Bishop-st. W
" 6% RydstMB	92	94	94	96	100 0	6% July 1 '96	100 0 0	\$200,000	"	"
Argen. Concessions	1/16	4/8	1/3	1/9	2/	—	0 2 0	150,000	S. Luis ...	3 & 5, Queen Street.
Oaylloma.....S	7 1/2	1	1 1/2	1 1/2	2 0	1/- Apr. '94	2 0 0	125,000	Peru .....	52, Leadenhall street
Colorado Mlt. ....N	3/4	1	3/4	1	5 0	2/6 Dec. 16, '95	6 0 0	32,000	Chili .....	18, King-st., Liverpool
Colombian Hy....G	2 1/2	2 1/2	2 1/2	2 1/2	1 0	1/- Jy 26, '95	1 0 0	75,000	Colombia	10, Blomfield-street
Coplapo .....	2 1/2	2 1/2	2 1/2	2 1/2	2 0	2/ May 29, '96	2 0 0	100,000	Chili .....	Dashwood House, E.C
Darien "A".....G	6	6 1/2	5 1/2	5 1/2	1 0	—	1 0 0	42,553	Colombia	Manchester.
" "B".....	7 1/2	7 1/2	6 1/2	7	1 0	22nd Apr 29 '94	1 0 0	30,000	"	"
El Callao .....	3	3 1/2	3	3 1/2	5 0	9 1/2 d. Feb. '94	5 0 0	267,000	Venezuela	8, Bishopsgt.-st., W
Frontino & B....G	1 1/2	1 1/2	1 1/2	1 1/2	1 0	9d. Oct. 15 '91	1 0 0	128,662	Colombia	184, Gresham House
Glenrock .....	6/	1/	1/	1/6	1 0	—	1 0 0	189,948	Arg. (A.I.)	3-5, Queen-street, E.C
Guadalupe .....	3/8	5/	—	1/8	1 0	—	1 0 0	120,000	Honduras	14, Union ct. Old Bld
Java'l .....	—	—	—	2/-	—	—	0 2 0	105,769	Nicaragua	139, Cannon-street.
Lagunas .....	2 1/2	2 1/2	2 1/2	2 1/2	5 0	15 p.c. Dec. '94	5 0 0	120,000	Tarapaca	2, Gracechurch-st.
Lautaro .....	5 1/2	6	5 1/2	5	5 0	5/- June 26 '96	5 0 0	110,000	Chili .....	70,
Liverpool .....	7 1/2	8 1/2	7 1/2	8 1/2	6 0	15/- May 14, '96	6 0 0	22,000	"	Liverpool.
Londen Nit.....N	3	2 1/2	2 1/2	2 1/2	3 0	3/4% Nov. '81	5 0 0	10,000	"	8, Gracechurch-st.
" Nit.(Pres.)	3 1/2	4	3 1/2	4	6 0	8% Nov. 28 '85	6 0 0	22,000	"	"
New Julia.....N	—	—	—	—	1 10	1s. Dec. '94	1 10 0	130,000	Tarapaca	50, Lime-street, E.C
" Tamaragal N	1 1/2	2 1/2	1 1/2	2 1/2	1 10	8 p.c. Feb. '95	10 0 0	120,000	"	"
" 8% Gun Pref	9 1/2	1 1/2	9 1/2	1 1/2	10 0	6 p.c. Feb. '95	10 0 0	\$280,000	Colombia	5, Copthall Bu'ld'g
" 6 p.c. Debt	9 1/2	1 1/2	9 1/2	1 1/2	10 0	6 p.c. Feb. '95	10 0 0	160,000	"	"
Nueva Esperanza	7/8	1/	7/8	1/	5/	—	0 5 0	160,000	"	"
Orita .....	—	—	—	1/9	1 0	1/- April '98	1 0 0	30,000	Colombia	10, Blomfield-street
Ouro Preto.....G	—	—	—	1/9	1 0	1/- Feb. '98	1 0 0	100,000	Brazil .....	6, Queen-street-place
Pas. & Jaspampa N	3/4	1	3/4	1	5 0	4/- May, '95	6 0 0	72,000	Tarapaca	3, Gracechurch-st.
Phoenix .....	-1/9	1/3	-1/9	1/3	16/-	—	0 8 0	400,000	S. Luis ...	3 & 5, Queen Street.
Rosario .....	4 1/2	5 1/2	4 1/2	5 1/2	6 0	3/- Aug. 13 '96	6 0 0	120,000	Chili ...	7 1/2 Old Broad-street
" (A. Deb.)	102	105	102	105	100 0	5% Oct. 1 '96	100 0 0	\$475,000	"	"
" Har' Deb Corp	103	106	103	106	100 0	5% July 1 '96	100 0 0	\$200,000	"	"
St. John del Rey G	3/4	7/8	3/4	7/8	1 0	2 1/2 Nov 13 '95	1 0 0	327,650	Brazil .....	Finley Ho., Blm'f d st
San Donato ....N	3/4	1 1/2	3/4	1 1/2	5 0	7/8 May 24 '95	5 0 0	39,000	Chili .....	17, King-st., Liverpool
" Jorge .....	4 1/2	5 1/2	4 1/2	5 x d	5 0	5/ Oct. 15 '96	5 0 0	75,000	"	2, Gracechurch-st
" Pablo .....	1 1/2	1 1/2	1 1/2	1 1/2	5 0	5/- Oct. 30 '95	5 0 0	32,000	"	"
" Sebastian .....	7 1/2	1 1/2	7 1/2	1 1/2	5 0	2/ July 15 '96	5 0 0	89,000	"	Dashwood House E.C
Santa Barbara ...G	3 1/2	3 1/2	3 1/2	3 1/2	18/	1/3 Dec. '88	0 10 0	60,000	Brazil .....	Liverpool
" Mioma .....	3 1/2	3 1/2	3 1/2	3 1/2	5 0	5/- Nov. 15 '94	5 0 0	22,000	Tarapaca	3, Gracechurch-st.
" Rita .....	3 1/2	3 1/2	3 1/2	3 1/2	5 0	19/ May 29 '96	5 0 0	29,000	Chili ...	Dashwood House, E.C
Tollima "A" ....N	5 1/2	5 1/2	5 1/2	5 1/2	5 0	5/- Mar. 11 '90	5 0 0	14,000	"	15, Finsbury-circus
" "B" .....	3 1/2	3 1/2	3 1/2	3 1/2	5 0	5/- Mar 12 '96	5 0 0	6,000	"	"



## LATEST FROM THE MINES.

## CABLEGRAMS AND TELEGRAMS.

**ALADDIN'S LAMP.**—The following cablegram has been received from the superintendent at the mines:—"Three weeks' return totals 1198 ounces of gold (approximate value £4100)—namely, 183 tons of ore have been crushed, yielding 875 ounces; and 3 tons rich crude ore have been shipped, containing 323 ounces."

**BARIMA.**—Cable advice received by the London agent from Demerara announce the result of the October clean-up to be 797 ounces of gold from 970 tons crushed.

**BRILLIANT BLOCK.**—Cablegram from the head office in Charters Towers:—"Have crushed during the month 1822 tons of quartz for a yield of 728 ounces of gold." The approximate value of this return is £2515.

**BRILLIANT GOLD.**—A cablegram has been received at the London office, Blomfield House, London Wall, E.C., announcing the declaration of a dividend of 4d. per share, payable on November 1. This dividend will be paid in London on all shares on the London register.

**BRITISH BROKEN HILL PROPRIETARY.**—The following is copy of a cable advice received from Adelaide:—"Have jigged 14 days to October 22, 4899 tons crude ore, producing 1447 tons concentrates, containing 974 tons lead, and 25,932 ounces silver."

**BLACK HORSE AND SANDSTONE.**—The London board have received information that a discovery of very rich quartz has been made about 1 mile to the north of the Sandstone Mine. The discovery is believed to be on the Sandstone line of reef, and if proved to be so the effect on this company's area may be of considerable importance.

**BLACK FLAG PROPRIETARY.**—A cable has been received from the company's representative in Coolgardie announcing that the mill will start on November 14.

**BROKEN HILL JUNCTION NORTH.**—The London office are in receipt of cable intimation from Melbourne that a third monthly dividend of 6d. per share has been declared, and is payable on the 11th proximo.

**CRIPPLE CREEK PROPRIETARY.**—The company has received the following from Mr. Laurence T. Gray, resident engineer at Bare Hills, Cripple Creek:—"I have discovered a strong vein of jasper which crosses our Grecian group of claims. It is as yet unopened, and I had some of its float assayed by one of our best assayers in Cripple Creek, and it ran several dollars in gold. A steam hoisting plant has been ordered for one of the properties in the Bare Hills."

**FRASER GOLD (Southern Cross).**—The monthly dividend has been increased to 8d. per share; the developments continue excellent, and everything points to a continuance of the present prosperity.

**FRASER SOUTH EXTENDED (Southern Cross).**—The manager of this mine, which has been acquired by an English Liability company, cables:—"Shaft has reached 104 feet; there is every encouragement."

**FRASER SOUTH.**—Mr. Jacobsen cables that the crushing during this week has yielded 183 ounces of gold from 195 tons of ore.

**GOLCONDA.**—Copy of cablegram received from the mine manager, dated Lake Austin, Que., Western Australia, Oct. 23:—"Have struck a flow of fresh water in a prospecting shaft about two miles distant south-east, and in site of this mine. Will telegraph again as soon as possible as to quantity."

**GREAT REEF.**—Mr. Sherlaw cables as under:—"Great reef: Crushing will commence this week. Have been delayed by non-delivery of pumps."

**HADLEIGH CASTLE.**—The following cable has been received from manager at mine:—"Mill has been working day and night for 24 days, and has crushed 265 tons in that time, yielding 202 ounces. Shall not be able to remit. The expense entailed by improvements."

**HANNAN'S KING (Brownhill).**—Mr. A. G. Burge, the company's own engineer, cables from Kalgoorlie (Hannan's) under date October 26:—"Have just come up to the mine. I am glad to report favourably on the property. Have opened a large body of high grade ore. Assays very satisfactory. The mine will undoubtedly become a very valuable property."

**HANNAN'S LODGE.**—The following cablegram, dated October 24, has been received from the company's managers, Messrs. C. J. McCulloch and Co., Kalgoorlie:—"No. 1 shaft. Crosscut on the 100 feet level south-west 7 feet. No. 3 shaft. Distance driven in crosscut since is 42 feet. No material change.—Connolly."

**HARRIETVILLE.**—The company has received the following cablegram, dated 30th instant, from the mine, viz:—"130 tons, 69 ounces. There are indications of improvement in Bibby's."

**KAPANGA.**—The directors have received the following telegram from the manager, viz:—"The 1000 crosscut to the west has been extended 15 feet. Have commenced driving the vein. In the south-east crosscut the vein has improved. In the 940 the vein is looking well, a strong and well-defined lode showing gold freely. The stopes show some improvement. No change elsewhere."

**LONDON AND NEW ZEALAND EXPLORATION.**—The company's agents in New Zealand report as follows:—"Bay View. Since we took over the property two reefs not previously located have been cut. We are preparing to sink a winze on a small reef known to be very rich, and from which a parcel of 10 tons of stone was taken a fortnight ago, yielding 4 ounces of gold to the ton. The method of treatment being deficient the tailings assayed £10 per ton."

**LUCKY GUSS (Cripple Creek).**—The manager has shipped the ore extracted in development work during September, which realised \$4436.54 nett.

**MENZIES LADY SHERRY.**—The following cablegram has been received [from the secretary of the above company:—"Expect to start milling about the middle of December. Ore reserves now in sight, estimated tonnage 1800 tons. Main-shaft is down 140 feet."

**MENZIES GOLD REEFS PROPRIETARY.**—Cable information to the following effect has been received from Mr. Jowett, the manager at the mines:—"Marked improvement in (the) assay value for gold per ton (of) week(s) samples.—Friday claim. In the north end of level No. 3 lode 1 foot (wide), assay value for gold 3 ounces 3 dwts. per ton.—Lady Shenton No. 1 south claim. Have intersected lode west of D shaft (at the) 100 feet level, quartz and ironstone, 2 feet 6 inches (wide), assay value 1 ounce per ton, six samples. £3 1s. 7d. both (Menzies Reefs Company) (Menzies 'Crusoe' Company)." Office note. The latter part of the above message, "£3 1s. 7d.," is interpreted as the present average sterling value realised by the bullion per ounce, which Mr. Jowett was requested to cable.

**MENZIES MINING AND EXPLORATION (O'Driscoll).**—Cable received October 26:—"Started crushing to-day."

**NERBUDDA COAL AND IRON.**—The coal sales for the month of September last amount to 342 tons.

**NEW QUEEN.**—The directors have received the following cablegram, dated Charters Towers, October 23, giving result of crushing for past fortnight:—"No. 5 formation (1270 feet), 109 tons, yielding 80 ounces of gold. Have drawn on you for £300. The rock is becoming harder in the shaft; 86 feet sunk during fortnight."

**OCTAGON EXPLORERS.**—Mr. James Breen reports:—"The reef at Tower Gap Leaser is in cement on a flat; is about 2 feet 6 inches wide, with gold showing all through the stone."

**PAMBULA.**—The mining correspondent of the *Sydney Morning Herald* telegraphs under date September 19 as follows:—"The Pambula Gold Mines (Limited) have struck splendid stone in the main shaft at 90 feet. Ore very similar to Falkner's, and shows fine gold freely. The best stuff is 2 feet wide. There is also very good stone in the Pambula Extended shaft (G. L. 203) on Hidden Treasure lode."

**PAHANG CORPORATION.**—The directors announce the receipt of a cablegram giving the returns for the month of September as follows:—"Jeram Lumpong mill. In 23 days of 24 hours each 825 tons of stone were crushed, producing 35 tons of black tin; 20 head of stamps running; working costs \$11,250. Have been obliged to stop for repairs.—Jeram Batang mill. In 26 days of 24 hours each, 805 tons of stone were crushed producing 38 tons of black tin. 20 head of stamps running; working costs \$7000."

**PHENIX (Tipperary Mine, New Zealand).**—The directors on receipt of the cablegram from Mr. W. J. Stanford, the general manager, that payable ore had been struck in the 7th level, cabled him to at once put through 100 tons with a view to ascertain the value of the ore. The following cablegram has been received from Mr. Stanford, dated 26th inst.:—"Crushed 101 tons, obtained 61 ounces."

**PREECE'S POINT PROPRIETARY (Hauraki).**—The directors have received the following telegram from the manager, viz:—"During the week the shaft has been sunk 8 feet. The country rock is heavily charged with iron pyrites. In the south crosscut we have intersected a quartz vein and leader of much promise. No change in the character of the rock. Hope to intersect main lode shortly."

**QUEENSLAND MENZIES.**—Cablegram from the head office of the above company:—"Expect to start milling towards the end of November. Mine shaft is down 220 feet. Ore reserves now in sight over 3000 tons. Water is available for three months."

**SHERLAW'S GOLD MINE.**—Mr. Sherlaw cables as follows:—"Sherlaw's Gold Mine: Concentrating all work to the main shaft."

**SAN SALVADOR SPANISH IRON ORE.**—The s.s. *Sully* sailed from Santander on the 22nd instant with 1850 tons of this company's ore for Glasgow.

**SHEBA.**—The following cablegram has been received from the general manager:—"Have discovered a good body of pay ore Soper shaft. A new reef."

**ST. JOHN DEL REY.**—The following telegram has been received from Mr. Chalmers:—"Produce 10 days, second division October, 10,000 civitas, equal to 1152 ounces troy, value £3875; yield per ton, 4.7 civitas (54 ounces troy)."

**TRIUMPH (Hauraki).**—The company have received from the mine manager the following cablegram:—"Ore now being extracted from winze No. 2 full of visible free gold. Ore body now being developed from rise No. 3; prospects are encouraging."

**VICTORIA GOLD MINING ASSOCIATION (Charters Towers).**—The following cablegram has been received at the London office:—"278 tons yielded 372 ounces gold."

**VICTORIA REEF.**—The following cable has been received from the Melbourne agents, October 26:—"Sinking shaft for the purpose of obtaining sufficient water. Struck the main shaft at the lower level. Have struck the second reef at 53 feet drive from old shaft, width of reef is 3 feet. New find looks very favourable. Pieces of rock containing visible gold. North drift looking well."

**WASSAU (Gold Coast).**—A cablegram has been received advising a remittance of 373 ounces bullion for the first half of this month.

**WAIHI CONSOLIDATED.**—A cablegram has been received from the mine manager stating that the shaft has now reached a depth of 175 feet.

**WEBSTER'S FIND.**—Mr. Sherlaw cables as follows:—"Webster's Find. All the machinery is on the ground. Pushing forward erection. Reports from the mine favourable."

**ZEEHAN-MONTANA (Tasmania).**—The following cablegram has been received from Hobart, dated 28th inst.:—"Have shipped 185 tons silver lead ore containing about 129 tons 10 cwt. lead and 18,500 ounces silver."

## THE CYANIDE PROCESS.

## ZINC v. ELECTRICITY.

THE year 1895 witnessed the production of over 600,000 ounces of bullion by the cyanide process on the Rand. With such testimony to its value, it is not surprising that cyanidation should receive so much attention, or that directors and managers should interest themselves in its development, alert to reap whatever advantage may be offered. The Chemical and Metallurgical Society has done good service in the process for not only have several of its members identified themselves with improvements in its application, but the papers which have been read before the society and the discussions thereon must have been a boon to all those wishing an insight to its practice. It is to ask you to benefit the industry by entering upon the discussion of a somewhat vexed question that I am before you this evening. I refer to the methods of precipitation—a matter touched upon by our President in his recent address.

We are all more or less acquainted with the two precipitation processes at present in use on the Rand in connection with the treatment of tailings by the MacArthur-Forrest cyanide process—one the zinc process of Messrs. MacArthur and Forrest, the other the electrical process introduced by Messrs. Siemens and Halske. Both processes have received the attention of this society, but not sufficiently to have given our managers and others a clear conception of their respective merits.

To enable this question to be treated in a more thorough manner, I will proceed to place before you a few notes comparing the two processes, and which, although I wish that time and circumstances had permitted me to make them more complete, may yet suffice to lead to the settlement of a question interesting and important both to ourselves and the industry.

It is fitting that this comparison should open with a few words touching on the introduction of the two processes and descriptive of the plant and appliances required with each. Zinc was first made a practicable precipitant of gold from cyanide solutions by Messrs. MacArthur and Forrest, the inventors of the cyanide process, who conceived the idea of using it in the form of a fine thread, such as may be produced by turning down thin discs of zinc in a lathe. When the MacArthur-Forrest cyanide process was introduced to these fields in 1890, this filiform zinc was the precipitant adopted. So well did it

stand the test of practice that it was, until two years back, practically without the semblance of a rival.

The consideration of the reactions which result in the precipitation of the gold are beyond the scope of this paper; I would only remark the simplicity of the process—the auriferous solution flowing over the zinc has its gold extracted, the base metal taking its place in the solvent. In practice, the zinc is carried in long rectangular boxes, the number and size of these so-called extractor boxes varying with the capacity of the plant.

The accessories consist of a lathe for the zinc, smoking furnaces, drying and roasting furnaces, clean-up vats, and a filter press—these constituting practically the whole of the plant necessary for the precipitation and for converting the precipitate into marketable bullion. With this method of precipitation the strength of the so-called "strong" cyanide solution applied to the tailings is from 2 per cent. to 4 per cent., and the number of leaching vats such as to permit a treatment in as that in the boxes dissolves, these additions being made at intervals varying from a day to a fortnight.

A clean-up—the collection of the precipitated gold and its conversion into bullion—generally takes place once a fortnight, and the slimy precipitate, after filtering, being dried and roasted, and then smelted with the necessary flux, the fineness of the resulting bullion varying with the particular treatment to which the slimes are subjected. With about six exceptions, every precipitation plant on the Rand is of this type.

(To be continued.)

## BRITISH SOUTH AFRICA COMPANY.

In issuing the notice convening an extraordinary general meeting of the company, the directors desire to point out that it is necessary to call the shareholders together in order that their sanction may be given to further financial arrangements rendered necessary by the heavy and largely increased expenses incurred in connection with the rebellion that broke out in Rhodesia in the spring of the present year, but which the directors are glad to say is now practically over, thanks to the bravery and energy displayed by the settlers in Rhodesia, and to the splendid services voluntarily rendered, at great personal peril, by Mr. Rhodes. In addition to the rebellion, the company has had to cope with a most anxious and perilous condition of affairs, caused by a virulent outbreak of rinderpest, involving the loss of literally hundreds of thousands of oxen, many being killed by the disease and many being slaughtered in attempts to stay the progress of the plague. Shareholders will appreciate how heavy, in these circumstances, has been the drain upon the company and its resources during the present year. Although it is feared that the abnormal expense thrown upon the company is not yet over, it is believed that the end can be seen, and reliable estimates formed. The half million cash in hand, mentioned in the communication issued by the board to the shareholders, under date February 10 last, was soon exhausted, and in July last the directors were compelled to create a mortgage debenture debt. An issue of £1,250,000, bearing interest at 5 per cent. per annum, was successfully effected at 97, without any appeal to the public. This, however, has not proved sufficient, for in addition to the outlays for war, the administrator and other officers of the company have been compelled to make arrangements at great expense for provisioning the country during the coming rainy season, the chief mode of transport by ox wagon having failed in consequence of the cattle plague. The directors appeal confidently to their shareholders to support them in the present situation, and in sanction the increase of the capital of the company indicated in the annexed notice—namely, by the creation of 1,000,000 additional ordinary shares of £1 each. Pursuant to the policy adopted in the past the board deprecates the creation of any preference or other special class of shares. It is proposed to at once issue 500,000 of the new shares, and to invite the shareholders to subscribe for them *pro rata* at £2 per share, a price somewhat below market value. Influential shareholders have been consulted and approve the scheme. On their advice underwriting arrangements have been made, and 800,000 of the half million shares have been underwritten at the issue price £2 (subject to the usual brokerage of 6d. per share), in consideration of a call of 150,000 shares at £2 15s. per share until the end of November, 1897. The capital thus to be raised will, it is calculated, provide the balance of exceptional expenditure and meet the excess of ordinary administration charges over revenue, during the next 12 months with peace and a normal condition of affairs. The confidence hitherto felt by the directors in the future of Rhodesia has in no way been lessened by the recent unfortunate events. These events have given a great impetus to railway enterprise, and it may now fairly be expected that the two railways—the one from the east coast and the other from the south through Bechuanaland—will meet between Salisbury and Bulawayo in a very few years. The Bechuanaland Railway, which is advancing rapidly from the south, has now reached a point 140 miles from Mafeking, will near Palapye by the end of April next, and reach Bulawayo towards the end of 1897. The Beira Railway Company on the east has, with its ally, the Beira Junction Railway Company, arranged for a through line from the Port of Beira on Pangwa Bay to Umtali (a few miles beyond the anticipated Portuguese frontier), to be opened next May, and negotiations are maturing for the immediate extension of the railway to Salisbury. Although the trial of Dr. Jameson and his officers, referred to in the circular of February 10 last, has been concluded, recent events in South Africa are to a certain extent *sub judice*. The directors will hold the ordinary general meeting of the company as soon as they can put the whole position before the shareholders.

## HAMPTON GOLD HILL MINES.

A circular to the shareholders states:—"I am instructed by my directors to inform you that after long negotiations, having previously examined the reports of several properties, they have at last succeeded in securing for this company a property consisting of two mining leases which they believe will prove to be very valuable. The property is situated in the Kurnalpi district of Western Australia, and has been very favourably reported upon by Captain William Oats. The board, however, decided before concluding the purchase to have an independent examination made for the company, which was undertaken by Messrs. Bainbridge, Seymour, and Co., who report your directors consider very satisfactory. The directors are glad to inform the shareholders that by the terms of the purchase the vendor has taken 90 per cent. of the purchase price in fully-paid shares, thus leaving the cash capital of the company largely available for the development of the properties. The directors have also made arrangements with Messrs. Bainbridge, Seymour, and Co. to act as consulting engineers, and they will select and appoint a competent manager to act under their supervision as mine manager. The directors, in consultation with Messrs. Bainbridge, Seymour, and Co., have decided that the property should be thoroughly developed and a good reserve of payable ore secured before purchasing and erecting the permanent milling plant."



BRITISH MINES.

### MISCELLANEOUS.

**NAYNE PROPRIETARY.** Mine workings for the northright T355 tons.  
 Range 111-120 feet level driven 4 feet, total 235 feet. Has passed through the crosscourse mentioned in my last. The lode has continued strong west as far as the hanging wall, but we have not met any defined ore there passing through the crosscourse. The course of the lode is about a little more to the east than usual. The ore continues as a good character, being siderite with fahl ore and yellow copper. From below it is silty sunk level 4 feet, total 25 feet and timbered for 25 feet. We are now at the sinkage of surface water in this winze, which is very low from storm. Lode in bottom carries 18 inches wide of siderite and oxidized material against the hanging wall. The horse of mullock in the north end is cut by the lode and lode is much compact. 500 foot level driven 8 feet, total 235 feet. This level is 16 feet wide between two good walls now standing nearly vertical. There are several veins of iron pyrites with a little calcite through

the Waitekauri Extended, the auriferous channel continues through the claim known as the Takapuna, upon which you have an option, and which is being developed by the Gold Fields of New Zealand. Then through the Waitekauri Consols, through a number of properties consisting in all of about 1200 acres. Of these, the only one that has up to the present been developed to any extent is the Volunteer, which belongs to your company, and is being worked by me on your behalf. It is rich in gold, but the difficulty is that the main reefs have to be assayed through a mass of stone in the watercourse above one of the main reefs gave assays on samples taken by myself from 30s. to £3 per ton, gold being worth about £3 12s. per ounce. I am driving a tunnel to cut this reef about 60 feet below the outcrop, and otherwise prospecting the property. I expect some very good developments in this claim, as it is evidently at the junction of cross lodes with the main lode channels. All of the other blocks, constituting 1200 acres alluded to, your company have either a hold on or can get such. Continuing along the same line, the next properties on which your company have options are the Bank of New Zealand and National Bank, in all, nearly 1000 acres, but not yet developed. These blocks are owned up by me, mainly on account of their position. Then passing on to the locality known as Ohu, you have options on about 16 blocks, all of which are more or less being developed by me on your behalf. The Golden Hill, Last Chance, and Harp of Tara have a main lode that on the top of the hill has been exposed and shown to be over 100 feet wide, yielding on assaying up to £2 per ton. This lode I consider a most valuable one; it is being thoroughly tested by us at the present time by a tunnel driven to cut at some distance below the outcrop. Very rich stone was struck in a large reef in the Maori Land just before my departure for London, and nearly all the claims are more or less developed well. On what I consider as the Waihi lode of lode I have secured options on two blocks, constituting a property known as the Waitea, which are really not developed at all, but are situated on what I consider as the line of the celebrated Waihi lode. I have also secured options on two blocks adjoining the Broken Hill property to the south and west, and known as the Tairua Special and Broken Hills Extended. These properties are being prospected by me on your behalf. I have also secured an option on four blocks of lode lying to the south-west of the Broken Hill, known as the Colosseum, the Tairua, the Light of Asia, and the True Ring. Large quantities of gold have been discovered in these blocks, and I consider them as in all probability being situated on the Broken Hill line of lode. You will see that all the properties I have secured on your behalf under options or otherwise, and which I am developing as I deem most advisable under the local superintendence of my brother, Mr. Thomas Seaver, who is my partner in the firm of Seaver Brothers, are situated in the very best possible position; that in most of these properties the development up to date is satisfactory, and that the property known as the Broken Hill has already given indications of proving itself of immense value. It now remains for you, gentlemen, to consider as you require the reports from the field, and to decide upon providing capital to work the same. I herewith enclose the account up to date of money expended by me on your behalf, and congratulate you upon the position you certainly occupy in comparison with other companies that have been formed for a similar purpose to yours.—Jonathan Seaver.

**BLACK FLAG PROPRIETARY.**—The following is the mine manager's report for fortnight ending September 5:—South haul-

The secretary to the ISLE OF MAN MINING COMPANY (LIMITED) inform us that he has sold 100 tons of this company's ore at £9 4s. 6d. per ton.



"KNOWLEDGE."—The current number of "Knowledge" contains, as usual, some excellent plates, one of them depicting the Sun spots, as recently seen at Greenwich. The reading matter is fully up to the usual standard of interest.







Party, have sunk the shaft an additional 23 feet 6 inches, making the total 458 feet 6 inches. The shaft is still passing through dolomite rock of a very favourable character. Good progress is being made with the new braced and surface arrangements generally. The steam pipes have been drilled and put in position, and the necessary connections made.

**CONTINENTAL AND WESTERN AUSTRALIAN TRUST.**—The following information is to hand by mail from the company's manager, Mr. Edward Hooper: Nine of Hearts lease, satisfactory progress is being made with the development of this option, and I have just received the assay result of two samples, which are as follows: Lode in east crosscut 6 feet wide, 4 dwts. 21 grains. Stone in shaft 2 feet wide, 13 ounces 1 dwts. 11 grains.—Champion lease. The mine manager reports that in shaft No. 2 the reef has been struck 2 feet 6 inches wide, showing rich gold.

**CRAYEN'S CALEDONIA.**—The following fortnightly report has been received from the mine, dated Charters Towers, September 18: In the underhand stop from No. 8 level the reef averages about 6 inches in thickness. The crosscut going west from No. 8 level has been extended a further distance of 13 feet, making a total of 25 feet. At this point we have struck the reef, and it is about 9 inches in thickness, and by extending this level a further distance of about 10 feet we will break through into the Caledonia block. In No. 7 level on hanging wall reef has been extended a further distance of 7 feet, making a total of 139 feet from the starting point. The reef in the level averages about 6 inches in thickness. In the No. 5 level over the reef the reef averages from 6 to 9 inches in thickness. The haulage of air quarts for the company for this fortnight is about 41 tons, making a total of 101 tons in the paddock. Hooper and party in No. 6 level have got about 21 tons of stone broken. Francis and party over No. 6 level have got about 10 tons of stone broken. Sabadin and party have extended the level a further distance of 1 foot, making a total of 37 feet from the starting point, and this party have got about 14 tons of stone broken. Gribbon and party in the Victoria reef have got about 61 tons of stone broken.

**DAY LAWN BLOCK AND WYNDHAM.**—Mine manager's report for fortnight ending September 5:—No. 2 underlie shaft, 17 level west driven 16 feet, or 58 feet from shaft. Formation 22 feet wide. Reef 2 to 3 feet wide with leaders through reef. Reef in leading stop 4 to 5 feet, 18 dwts. 17 level east driven 5 feet, total 77 feet. Formation 30 feet wide with three veins of quartz. On footwall 2 feet, in centre 2½ feet, on hanging wall 13 inches, worth (say) 1 ounce per ton.—16 level west. No. 1 winze sunk 23 feet. Reef on footwall good mineral stone.—16 level east. No. 3 winze, 68 feet deep, has apparently gone down on a false wall. Stop 5 feet, 17 dwts. stone.—15 level east. Day Dawn reef 15 inches, 15 dwts. 10 ounces. 14 level west. 14 level east. Rise under No. 3 shaft is 90 feet high. A very promising formation has been met with carrying 18 inches of rubble quartz with a fair amount of mineral in it. Stop 10 inches, 12 dwts.—13 level east. Crosscut from Tallman reef 28 feet in.—13 level east. Crosscut from Tallman reef 50 feet in.—13 level west. Stop 10 inches, 15 dwts.—12 level east. Stop 10 inches, 15 dwts.—11 level west. Rise to No. 4 level 50 feet. Reef ¼ feet, 1 dwts. Stop 4 feet, 13 dwts.—4 level west. Winze to meet rise from 10 level 30 feet. Formation 4 feet with quartz leaders.—No. 3 shaft underlie. Connection has been made with the mine, No. 4 level west.

**EAST MURCHISON UNITED.**—Mine manager's report, dated September 5: Dunsford shaft, sinking has been resumed on this shaft with three shifts of men. At 107 feet a leader was met with in the bottom, about 9 inches, showing coarse gold. The shaft at that depth was making about 300 gallons of water per hour. At 112 feet another quartz leader was met with, showing coarse and fine gold worth 1 ounce 6 dwts. per ton. This seems to be a portion of the formation mentioned in my report of August 3 in the crosscut westerly from No. 1 shaft. Since tapping this leader the water has increased to 160 gallons per hour, which is a good supply for all requirements. I found it impossible to sink further until we got the pump to work. We are now engaged timbering up the shaft, and some necessary work on the surface.—Battery. Everything is in order, and I intend to start the battery on Thursday, the 11th inst., as we have got a good supply of water in the dam.

**FREDERICK THE GREAT.**—Copy of letter from Bendigo, dated September 21:—Bendigo (Victoria), September 21.—We have the honour to report to you the following progress in your mine during the past fortnight. The level south of No. 5 and 630 feet from the surface has been driven a further distance of 35 feet and timbered, total south of main crosscut 530 feet. The stone in the face of the level looks more promising, with nice black slate face mixed with stone, which is carrying a quantity of muddle and galena, and showing a little gold. A winze has been sunk from this level at a point 526 feet south of the main crosscut, and is down a depth of 9 feet below the level. This winze is 7 feet long, all in stone of nice appearance, intermixed with minerals and carrying fair gold. A rise has been started on the stone in the 630 feet level at a point 90 feet south of the main crosscut, and put up 13 feet and timbered. Stone in the top of the rise 2 feet 6 inches, south of level and 2 feet in north side, and shows a little gold. The intermediate level north 58 feet below the 530 feet level has been driven 6 feet, total north of winze 61 feet. The stone which carries the gold is rising very fast. The stone in the stopes over the level is well charged with minerals, but is not showing so much gold. We cleaned up the batteries on Saturday last, 200 tons giving a yield of 62 ounces 8 dwts. gold. We have to acknowledge receipt of your cable of 8th inst.—"Board recommend you continue driving 630 level. What is the prospect of continuous crushing. How much can you save in the tailings. What will it cost to plant." And we replied immediately—"Driving 630 there seems every prospect crushing, we cannot recommend plant." The reason of our sending this reply is on account of the result of the assays made being so low. We do not think the tailings are of good enough quality to treat at present, and consequently we have not gone to the expense of getting plans and estimates prepared of the plant required; but if you consider it advisable we can have plans prepared, and await your instructions in the matter. We enclose your statement of accounts and vouchers for last fortnight's payments.

**GRIERSON'S GOLD.**—The manager, under date of September 21, reports as follows: Have sunk main shaft a further depth of 16 feet, making total depth from surface 28 feet. Have also timbered shaft. The lode is opening up well and showing good freely, country being quartz that is passed through. I intend to push on the sinking of this shaft down to water level, and have every hope of its opening up well.

**GREAT BUNYONG ESTATE.**—Satisfactory progress is being made at the alluvial shaft setting pumps. The workings of the large plunger lifts have been placed in position. Putting skips in the shaft. Sinking at the quartz shaft continuously proceeded with, but progress retarded by increasing water as depth is reached.

**KINSELLA GOLD.**—Copy of mine report for fortnight ending September 17: 160 feet level, north drive, section 14. Nothing further to report in this locality, no work having been done.—100 level, south drive, section 23. Western crosscut 500 feet south of main crosscut is now in 57 feet, and still in clean country, only small leaders having been met with. Six men in this end.—100 level, north stop, section 14. Four men here, taking about 2 feet of stone.—110 level, south stop, section 21. Six men stopping here. Lode 2½ feet thick. Intermediate drive north and south of No. 1 north shaft is taking 4 feet of stone.—South drive in 63 feet, section 16. Six men, lode 4 feet thick. No. 2 intermediate winze north, section 14, was sunk 15 feet, making total depth 35 feet; had to stop further sinking on account of water. A crosscut was then started at bottom of this winze east to strike east vein, which was seen in level below. This was struck on Wednesday, and is about 1 foot wide, four men here.

**LONDON AND WESTERN AUSTRALIAN EXPLORATION.**—Mail reports to hand: Mount Magnet Proprietary, Mr. Walker and Mr. Plancher have just inspected these properties and appear well pleased with them. They took a large number of samples, and Mr. Oalder advises me that in panning off the reef as yet. We have gone so far through 21 feet of stone, which prospects evenly all through 27 dwts. or 30 dwts. per ton. I imagine we are nearly through her, the last few feet (13 feet) in very solid limestone.—Hanson's shaft. This shaft is sunk to a depth of 44 feet. The reef has made into a compact body of 5 feet of stone, and are raising very good stuff. Taking her all through 1 estimate her at 44 feet at a little under 2 ounces the reef here being twice as large as she was on the surface.—Prospecting party on Block 43 Hampton Plains. I am trying a large reef about ¼ mile north-east of camp. It is from 10 to 15 feet wide; some of the stone is well charged with pyrites and appears well worth prospecting.

**LADY EMILY.**—The manager writes from Coolgardie, under date September 23, as follows:—Main shaft. Have stripped the reef a further depth of 6 feet, making a total of 10 feet. I should have broken down the reef on this, but in doing so it would have endangered the shaft to great extent. I intend to wait until the reef comes well into the shaft, then open out for No. 1 level, and when sets are in will trim down overhead and timber to the bottom. A shot was put into the reef, which showed it to be a fine compact body of stone fully 3 feet thick, proving that it is increasing with depth, and I am convinced that it will also improve in quality. I am pleased to say that water is coming in at bottom of shaft, evidently coming from reef channels.—Underlay shaft. This has been sunk to a depth of 72 feet, and the reef has merged into a large quartzite lode highly mineralised, and colours of gold can be seen in it. As soon as the contract is finished to the 90 feet level I shall crosscut the lode and prove it from wall to wall. It appears to me that it will prove an enormous lode, rich in the precious metal. I am very much pleased with present appearances throughout the property, and it is only a matter of little time and patience to prove it to be one of the best mines in this locality, if not the best.—Re Menzies railway. The public mind on the gold field has been very much exercised during the past week or so, through the statement that the Government intend starting the railway to Menzies from Southern Cross, instead of Coolgardie, which should be its starting point, Coolgardie being not only the geographical position, but the commercial centre; and, above all, the line from Coolgardie to Menzies will pass the thickly populated mining centres right through to Menzies, and would later be the direct line to Esperance Bay, our nearest seaport. Should the line start from Southern Cross, it will go through a howling wilderness of some 140 miles, and will not in any way serve the mining districts. It also means the great British interests being at stake, and the best of the gold field would be in jeopardy, to a great extent. If the Southern Cross idea be attempted to be carried out, the whole of the gold fields are prepared to seek separation, that we can get our just rights, and a deputed body of representatives will leave here with a petition to the home Government praying for a separation from the Western Australian Government. We wish all those at home who are interested in these fields to give a helping hand for that purpose, and to preserve their interests, which are seriously at stake.—(Signed) H. T. Rowe.

**LADY MAUDE GOLD MINES.**—The manager, under date of September 23, reports as follows: On the 11th inst. I cubed as follows: 1. Surprise main shaft. Have cut a lode in crosscut. The quartz is 11 feet 8 inches wide, quartz well average about 16 dwts. per ton. With reference to this reef I have to state there is another layer of quartz on the back of the large reef, making a total of 14 feet of crushing dirt. To-day I started driving north on the centre of reef. The stone looks very kindly, and as occasional colours of gold have been seen it is quite possible we may be close on a good chute of gold.—Water shaft. The repairs to this shaft are nearly complete. The contractors will resume sinking about Friday.—Maudie main shaft, I have continued sinking the wall, and am now putting in the opening sets for the crosscut. The water is coming

from the west side of the shaft, whereas the east side, where the lode is, being comparatively dry.

**LONDON AND WESTERN AUSTRALIAN INVESTMENT.**—Hannan's water rights.—The company's agent, Mr. Alex. Matheson, reports that the shafts on water rights Nos. 81 to 92 have reached a depth of about 85 feet each, and sinking is progressing at the rate of about 2½ feet a day. The present price of water rights is 34. per gallon. The population of the town is increasing by 40 or 50 people every day, and no corresponding increase is being made in the water supply; therefore, a very large price is expected to be realised when the hot weather comes on for the water from the company's wells.

**MENZIES GOLD ESTATES.**—Mine manager's report dated September 19: There is no important change in any of the different workings to report this week with the exception of No. 2 shaft on Aurilla lease, which I am pleased to say has improved in this 6 feet sunk during the week. The lode is stronger and more compact. A sample of the quartz for 2 feet wide, assay 3 ounces 19 dwts. 21 grains gold per ton, which is very encouraging indeed, and no effort will be lost in putting this shaft down as fast as possible. The present depth from surface is 123 feet. The north drive which intersected with south drive from No. 1 shaft is now squared up, and a crosscut is being driven into the footwall side. So far we have run 4 feet, but have not struck any new veins of quartz. The ground seems to be all formation and easy for working. The men on Oisone have been cutting timber, consequently scarcely any sinking done for the week. The main shaft on Etrensia is now out down for 30 feet, timbered and divided into three compartments. There are six men employed in this shaft. I intend to put up the pit head frames on this shaft, and erect hoisting plant after the mill is completed. The ore feeders are fixed in place at the mill, and we are now putting in water pipes and concrete blocks for bearings under main driving shaft. The engine beds will now be made as the material is at hand.

**MCKENZIE GOLD.**—I beg to send you the following report: McKenzie, Glenloch, fortnightly report: Main engine shaft. Sunk 12 feet, or 21 feet from pit, total depth from surface 141 feet. Ground much changed, with floors every few feet. If present ground continues to water level anticipate strong supply.—No. 1 shaft 40 feet level sunk. Stop below this level yielding stone equal to 2 ounces gold per ton. Ground very hard, and sloping underhand. The two combined makes progress slow.—Crushing. The third 10 tons crushing will be completed during the coming fortnight. Have lodged 23 ounces amalgam in the Bank of Australasia.

**MOUNT LYELL MINING AND RAILWAY.**—Engineer in charge of mine reports for week ending September 11: No. 1 tunnel, north drive, extended 4 feet, total 75 feet. No. 2 tunnel, south drive, extended 4 feet, total 32 feet. No. 3 tunnel, main crosscut, north drive, drive extended 4 feet, total 28 feet. No. 4 tunnel, south drive, drive extended 5 feet, total 571 feet. Well in this drive is making a turn to the left. No. 4 tunnel, south drive No. 3 rise, has been put up 3 feet, total 45 feet. No. 4 tunnel, south drive, No. 3 rise, put up 2 feet, total 35 feet. No. 4 tunnel, south drive, No. 3 and 3 stops, Ore has been stopped here during the week.—Surface work. No. 1 tunnel, north drive, extended 4 feet, total 75 feet. No. 2 tunnel, south drive, extended 4 feet, total 32 feet. No. 3 tunnel, main crosscut, north drive, drive extended 4 feet, total 28 feet. No. 4 tunnel, south drive, drive extended 5 feet, total 571 feet. Well in this drive is making a turn to the left. 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## PROVINCIAL SHARE MARKETS.

## THE CORNISH MINE SHARE MARKET.

Mr. MICHAEL WILLIAMS BAWDEN, Mining and Assaying Offices, Cornwall, writes October 29:—The Mining Share Market at the opening of the week was firm with a *resumé* of business, but the improvement of tin, reduced stock and increasing demand, led to the unexpected drop has checked further enquiry for shares. Quotations:—Basset United (Limited), 15s. to 16s.; ditto (5s. 6d. to 6s. 6d.); Blue Hills, 3s. to 4s.; Carn Brea United (Limited), 4s. to 4s. 6d.; ditto (2s. 6d. paid), 2s. to 2s. 6d.; Devon Consols, 17s. to 18s. 6d.; Dolcoath (Limited), 16s. to 17s.; East Pool, 6s. 6d. to 6s.; East Pool, 17s. to 18s.; Killisnoe (Limited), 1s. 6d. to 2s.; Levant, 2 to 2½; Polberro, 5s. to 6s.; West Quay, 2 to 2½; Wheal Grenville, 4½ to 4¾; Wheal Kitty, 4s. to 4½; Wheal Metal, 3s. to 3s. 6d.

Messrs. ABBOTT and WICKETT, Stock and Share Brokers and Mining Share Dealers, Redruth, write under date of October 29:—The market has been better this week, and there are buyers of West Kittys, Basset United, Dolcoaths, and Grenvilles, but sellers are only a very limited number of shares. Quotations herewith, but only a very limited number of shares are obtainable at the highest quotations:—Blue Hills, 1s. to 1s. 6d.; Basset Mines (fully paid), 3 to 3½; ditto (5s. paid), 4s. to 5s.; Dolcoath (fully paid), 16s. to 18s.; ditto (7s. 6d. paid), 4s. 6d. to 5s. 6d.; East Pool, 6 to 6½; Killisnoe, 4 to 4½; Polberro, 5 to 5½; Wheal Grenville, 4½ to 4¾; Wheal Kitty, 4 to 4½; Wheal Metal (3s. paid), 3s. 6d. to 4s.

## MANCHESTER.

Messrs. JOSEPH E. and W. P. BAINES, Stock and Share Brokers, 7, Market-street, write October 29 (12 noon):—The past week on which we have to report includes a fortnightly movement nominally concluded to-day. It would appear that, in regard to the condition of the Money Market, commitments on the buyers' side have been largely reduced before the carry-over, and the "shake-out" apparently has been pretty well exhausted. This being so, and no doubt anticipated, Consols, though no longer the distinct pulse of the market they once were (although with money dearer they seem more like approaching that condition), are higher. Colonial Stocks and Corporation Stocks and Debentures all mark lower, with the exception of Birmingham Three and a-Half per Cent., which have advanced 1, whilst the same city's Three per Cent. is a like amount lower. In regard to the only changes of movement in Europeans are as follows:—Russian Four per Cent. ½ up and Spanish Four per Cent. ½ down. The only other decline is found in Brazilian Four and a-Half per Cent., with a fall of 1, whilst Argentine Six per Cent., Portuguese Three per Cent., and Uruguay Three and a-Half per Cent., all quote better more or less. Coming to rails, although best prices are not maintained, home rails show a very general advance, many of them being over 2 per cent. up, even after some slight relapse. The only exception to the rule in this market is to be found in Metropolitan Districts, these showing rather over 1 down. Americans are very variable, the vicissitudes of the Presidential campaign being the chief factor in the daily changes. The alterations on the week in no case amount to a dollar, and, as indications of the general movement, we may say that whilst Louisvilles are ½ to ¾ up Milwaukee is ½ down. For further alterations have refer to details below. Canadian show Pacific ½ to ¾ down, but Grand Trunk, as will be seen hereunder, are all more or less better. Mexican rails show a decline in first and second preference. As regards minor markets the majority of changes in banks is a little on the downward side. In insurance, prices are better in all instances where marked, with the exception of Palatine, and in this exception it only amounts to 1-16. In coal and iron there are a few cases in which the alterations are notable. Telegraphs and telephones changes are few and slight. In breweries Guinness' have had a sharp rally. Beyond these Hardy's and Parker's (Buxton) each quote better, but the rest of the alterations are unimportant, except a fall of 1½ in Showell's. In miscellaneous there is very little to report, beyond a further rise in coals of over 2. Even also, in their last manipulation, are nearly ½ up, but it is simply owing to the credulity of the public that such an operation could be possible.

ENGLISH RAILS.—Higher: Caledonians, 2 to 3; ditto Deferred, 2½; Great Eastern, 2½; Yorkshire deferred, 1½; Great Westerns, 1½; Leeds, 2½; Brighton A, 2; Chatham, 2; London and North-Western, 2; Sarns, 2; Midlands, 1½; North British, 2½; Berwicks, 2½; Dover A, 1½.—Lower: Districts, 1½.

CANADIAN AND AMERICAN.—Higher: Grand Trunk Ordinary, 1-16 to ¼; ditto Guaranteed, ½; ditto First Preference, ½; ditto Second Preference, ½; ditto Third Preference, ½; Louisvilles, ¾ to 1; New York Central, ½; Erie, ½; Reading, ½.—Lower: Canadian Pacific, ½ to ¾; Mexican Rail First Preference, 1½; ditto Second Preference, 1; Milwaukee, ½; Danvers, ½; ditto Preference, ½; Miners, ½ to ¾; Norfolk Preference, ½ to ¾; Union Pacific, ½ to ¾.

CONSOLES.—Higher: Two and Three-Quarter per Cent., ½. COLONIAL STOCKS, &c.—Lower: Canada Registered, 1; New South Wales Inscribed, 1½; New Zealand Inscribed, 1; Victoria Inscribed, 1.

CORPORATION STOCKS AND DEBENTURES.—Higher: Birmingham Three and a-Half per Cent., 1.—Lower: Birmingham Three per Cent., 1; Blackburn Three and a-Half per Cent., 1; Manchester Four per Cent., 1; Nottingham Three per Cent., 1; Widnes Three per Cent., 2.

FOREIGNERS.—Higher: Argentine Six per Cent., 1½; ditto Five per Cent., 1 to 1½; Mexican Six per Cent., 1 to 1½; Portuguese Three per Cent., ½; Uruguay Three and a-Half per Cent., ½ to ¾; Russian Four per Cent., ½.—Lower: Brazilian Four and a-Half per Cent., 1; Spanish Four per Cent., ½.

BANKS.—Higher: Bank of Liverpool, ½; Imperial Ottoman, ½.—Lower: District, ½; Mercantile of Lancashire, 1-16 to ¾; Parr's, ½; Union of Manchester, ½.

INSURANCE.—Higher: Lancashire and Yorkshire Accident, ½; Liverpool, London, and Globe, ½; London and Lancashire, ½; Manchester Fire, ½; Royal, ½; Union Marine, 1-16.—Lower: Palatine, 1-16.

COAL, IRON, &c.—Higher: Boleck Vaughan (£20 paid), 2½; ditto (£12 paid), 2½; Ebbw Vale, 3; Parkgate, 3; Pearson A, 2 to 3; Trefgarra A, 2 to 3.—Lower: John Brown's, 2 to 1; Nantyglo Preference, 2.

TELEGRAPHS AND TELEPHONES.—Lower: Eastern, ½; Eastern Extension, ½; West and Brazilian, ½; ditto Preferred, ½.

SHOWELL'S.—Higher: Guinness', 10; Hardy's, ½; Parker's, ½ to 1.—Lower: Boddington's, ½ to ¾; Clarkson's, ½; Manchester, ½; Showell's, 1½; Taylor's Eagle, ½.

MISCELLANEOUS.—Higher: Bovril, 2 to 7-16; Coat's, 2½; Canard, 2½; Kellner, 2½; Howard and Bullough, 2 to 1½; Hudson's, 2½; Kellner, Partington, 1-16 to ¾; Manchester Palaces, 6d.; Nelson, Procter, ½; Rylands and Sons, ½; United Alkali, 1-16; Railway Debenture Trust, ½.—Lower: Fowler's, ½; Salt Union, ½; Four Cental, 1.

LATER (4 P.M.).—To-day has been, as far as the foremost markets are concerned, distinctly flat, Americans being to the fore in the change of tone. Canadians in sympathy, the same comparative minor, on the whole, a little better, but very little. Coal and iron shares a little above the best of the week.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

PROVINCIAL.—Mr. J. GRANT MACLEAN, Stockbroker and Ironbroker (October 29), writes:—During the past week the nervous feeling of confidence. The sales previously to close accounts no doubt made markets sounder, but the state of politics and finance

on the Continent is not yet sufficiently clear to bring about a decided recovery.

In shares of coal, iron, and steel companies the principal feature is an advance on Steel Company of Scotland shares to 6. Boleck Vaughan and Ebbw Vale are also higher. Chasell Collieries 4½s. 6d., Great Eastern Collieries 2½s. 3d., Marbella 28s. Harvey's Continental Steel offered.

In shares of copper concerns there has been more business doing. Prices advanced in sympathy with the market for the metal. Arizona touched 55s. 9d., Tinto 25 1-16, and Tharsis £6, but are now all easier.

In shares of gold and silver mines there has not been much business doing. Until the public get more confidence there is little chance of a substantial recovery. Chartered Company announce a meeting to authorise the issue of 1,000,000 new shares of £1; of these 500,000 will be offered at first at £2 to present shareholders. Chartered shares have declined from 50s. 7½d. to 45s. Consolidated Gold Fields declined to 9½, East Rand to 9½s. 3d., and Randfontein to 44s. on sales to close accounts, but are all slightly better. Afrikaander are at 27s.; Associated Southern, 23s. 9d.; African Estates, 28s. 6d.; Balaghat, 2s. 6d.; Broken Hill, 48s. 3d. xd.; Balkis Land, 4s. 6d.; Bantjes, 47s. 6d.; Broken Hill, Block, 60s.; Central Exploration, W.A., 11s. 3d.; Croesus North No. 1, 22s. 6d.; Consolidated Marchion, 8s. 9d.; Chaffers, 3s. 3d.; Emma, 1s. 6d.; East Nigel, 3s. 9d.; East Sheba Reef, 2s.; Eastleigh, 15s.; Exploration (New), 55s.; Faith, 9s. 6d.; Golden Arrow, 12s. 6d.; Golden Pah, 2s. 9d.; Golden Crown, 32s. 6d.; Great Boulder Main Reefs, 21s.; Gold Estates of Australia, 34s.; Hauraki Associated, 3s. 6d.; Hampton Plains, 67s. 6d.; Hainault, 27s.; Hall Mines, 37s.; Joker, 16s. 9d.; Leechdale, 4s. 6d.; Lake View Extended, 20s.; Marchion Gift, 2s. 4½d.; Mozambique, 26s.; Mainland Consols, 42s. 6d.; Mount Charlotte, 20s. 6d.; North Boulder, 16s. 3d.; New Queen, 7s. 6d.; North Crocydon, 3s. 10½d.; New Stern, 27s.; North Sheba, 4s.; Noltzykop, 1s. 6d.; Orion, 17s.; Porges, 25s.; Preece's Point, 3s. 6d.; Phoenix, 1s. 9d.; Port Phillip, 1s. 3d.; Pestarena, 5s. 6d.; Paarl Central, 23s.; Pilbarra Gold Fields, 15s.; Rhodesia, 3s. 3d.; Royal Oak, 2s. 3d.; South Luipard's Vlei, 9d.; Sweepstakes, 1s. 6d.; Springdale, 10½d.; Sheba Queen, 6s. 6d.; Sugar Loaf, 4s. 6d.; Sherlaw's, 10s.; Tokoten, 2s. 6d.; United Gold Fields of Manica, 10s. 9d.; Untoli 6d.; Violet, 18s.; West Australian Mining, 6s. 6d.; White Feather Main Reefs, 8s. 9d.

In shares of miscellaneous companies prices are steady. In oil companies Broxburn are at 9½, Hermand 1s. 3d., Pumpherton, 6; and Young's, 27s. 3d. Field's Candle Six per Cent. Preference are at 11½; Glenboig Fire Clay, 7½; and Nobel's Dynamite, 18s.

## EDINBURGH.

Messrs. THOMAS MILLER and SONS, Stock and Share Brokers, 69, Hanover-street, Edinburgh, report as follows under date of October 29:—There has been a general advance in home railways, Canadians and Americans, since last week's report, although the best prices have not been maintained. Caledonian Deferred has risen from 55½ to 58½, North British from 43½ to 46½. In insurance shares, Globes have advanced from 52½ to 53, Mercantiles from 37½ to 37½, Royal from 52½ to 53½. Scottish Union A have receded from 90s. to 88s. 6d., Bank of Scotland has declined from 351 to 348, National from 367 to 365, Royal from 233 to 230. Clydesdale Bank shares have improved from 20½ to 20½. Niddrie and Benhar coal shares have risen from 39s. to 41s., Cowdenbeath Coal from 18 to 19, Stewart and Clydesdale from 13½ to 13½. Steel Company of Scotland from 53-16 to 6, Arizona Copper from 50s. 9d. to 53s. 3d., Rio Tinto from 24½ to 24 9-16, Dalmeny Oil from 18 to 21. Bovril shares have gone up from 90s. to 98s. 6d., J. and P. Coats from 60½ to 62½, Noble Dynamite Trust from 18 to 18 1-16.

## THE IRON AND STEEL MARKET.

Messrs. BARRY, HEAD, and CO.'s weekly report, 26, Lombard-street, E.C., October 29, states:—Prices: Recently quoted figures fully maintained. Works are well occupied, and makers indisposed to book ahead, except at a considerable rise in price.—Prospects: We can only repeat that we have every hope of things going higher, and we are inclined to think that buyers who wait will probably have to pay more than they would to-day.

At a meeting of the directors of the BECHUANALAND TRADING ASSOCIATION (LIMITED) held on the 28th inst. it was agreed to pay, subject to audit, a further dividend of 10 per cent. free of income tax, making in all 25 per cent. for the year ending March 31.

The MOUNT MORGAN GOLD MINING COMPANY announce that a dividend of £25,000, being 6d. a share for the month of October, is payable November 2.

## FOR SALE.

\* Prepaid Advertisements are inserted in this column at the rate of 8d. per line with a minimum charge of 4s.

## GOLD MINE FOR SALE.

A MINING PROPERTY of 115 ACRES on the same belt as the Pumas Eureka, Pumas County, California. It has produced over \$675,000, but after being idle on account of trouble with parties supplying the water, it will require a large capital (say, \$100,000) to open a deeper tunnel and purchase the water supply, or utilise a fine water power some miles distant. For electric transmission, a large amount of ore will be made available by this tunnel, and the facilities for cheap working are unsurpassed. The price is \$250,000—one quarter down in cash, and the balance in one, two, or three years, with interest at 6 per cent., or other reasonable terms on the deferred payments.

For further particulars and report, apply to W. M. COURTIS, Detroit, Mich.

## GOLD MINING SHARES.

EXCEPTIONAL opportunity to PURCHASE several small lots of fully-paid SHARES at very low prices. Full particulars upon application to "SHAREHOLDER," MINING JOURNAL Office, 18, Finch Lane, E.C.

THE VALUABLE COLLECTION OF MINERALS MADE by the late T. A. READWIN, Esq., F.G.S., &c., added to which is a complete collection of WELSH GOLD ORES and over 300 polished AGATES and MARBLES (duplicate collection of Cardinal Antonelli's) collected by the Princess of Etruria.

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A NEW No. 2 INGERSOLL DUPLEX ROCK DRILL for hand power operation by two men. Will bore holes for blasting purposes from 1 to 2 inches per minute.

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TO BE SOLD, the Mineral Property called "DIOS TE GUIE," producing Silver and Gold, situated in the Section of Yepachi, Municipality of Famosachic, in the District Guerrero, State of Chihuahua, Mexico, by the Rascon Hermanos Company, of Nuevo Leon, Rayon District, State of Chihuahua, Mexico.

For information as to Price and Conditions of Sale, apply to RASCON HERMANO

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Contracts negotiated. Buying or Selling Agencies solicited. Zinc, Lead, Silver Lead, and Copper Ores' offers specially invited. Buyers of Ashes, Dross or Residues containing Lead, Zinc, Copper, or Silver.

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AN EXPERT MINING ACCOUNTANT DESIRES AN ENGAGEMENT ABROAD (Rhodesia or Westralia preferred) as Accountant or Manager. Excellent testimonials. Sureties. Address "H," care of THE MINING JOURNAL Office, 18, Finch Lane, E.C.

ASSISTANT MINING ENGINEER WANTED for Upper Burma, with experience of Mechanical and Civil Engineering. A practical knowledge of Surveying very necessary. Good social standing. Age not under 26. Salary to commence, £450. Apply by letter only, with full particulars of qualifications, to "ENGINEER," care of Messrs. C. BARKER and SONS, 8, Birch Lane, E.C.

THE FRONTINO AND BOLIVIA (South American) GOLD MINING COMPANY (LIMITED) require the services of a MILLMAN who has had experience in the treatment of Refractory Ores, and thoroughly understands the extraction of gold. He must have a knowledge of the machinery required for crushing purposes, and capable of erecting and keeping the same in order. The Company provides passage out and home, and finds board and lodging on the mine. Wages £15 per month. Engagement for three years. Applicants to send copies of testimonials to J. JAMESON TRURAN, Secretary, 184, Gresham House, Old Broad Street, London.

WANTED, YOUNG MAN who thoroughly understands CYANIDE PROCESS of Gold Extraction to experiment on a few tons of ore. Apply, JOHN HAMMOND, 86, West Hill, Putney.

ADDITIONAL WORKING CAPITAL. A Manchester firm can introduce same into a MANUFACTURING or MERCANTILE CONCERN of good repute at Bank rate. Principals only. Address in confidence to "C. 101," care of EMMISON'S Advertising Offices, Manchester.

TIN ORE, containing several per cents. of TUNGSTEN, WANTED. Offers to "L. 2136," care of RUDOLF MOSSE, Cologne.

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WANTED, for extensive Gold Mines in Montana, U.S.A., a THOROUGHLY COMPETENT MANAGER having experience in Mining, Milling, Assaying, and treatment of Concentrates. Applications must state age, experience, salary expected, &c., and be accompanied by testimonials, and must be lodged on or before 9th November, 1896, with WALTER K. SIMPSON, Solicitor, 146, West Regent Street, Glasgow.

WANTED, ENGAGEMENT as SUB-MINE MANAGER or MILL SUPERINTENDENT. Experience: Mining, surveying, assaying, superintending erection and working of concentrating machinery. Speaks Spanish. Good reference and testimonials. Address "A. S. E.," care of Mr. R. THOMAS, 13, Upper Baker Street, Regent's Park, London, N.W.

MINE MANAGER REQUIRED to TAKE CHARGE of Gold Mine in West Australia. Must be well up in the most modern surface and underground equipment of mines. Must have thorough knowledge of engines, boilers, compressors, mining and electrical machinery. Must understand the cyanide and chlorination processes for treatment of tailings, and be responsible for design of work, preparation of plans and estimates, and must supervise erection of all plant and machinery, construction of buildings, &c. Only gentlemen with good mining and mechanical experience need apply. Age should not exceed 40. Liberal salary will be paid. Address "ALPHA," care of DAVIES and Co., Advertising Agents, Finch Lane, Cornhill.

## SHIPPING.

## CASTLE LINE.—CAPE &amp; NATAL MAILS.

WEEKLY SERVICE FOR THE GOLD FIELDS OF SOUTH AFRICA.—The CASTLE COMPANY'S STEAMERS leave LONDON (East India Dock Basin, Blackwall) every FRIDAY, and sail from SOUTHAMPTON every SATURDAY.

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"Methven Castle (via Canaries) ... November 17 ... November 16  
"Pembroke Castle (via Canaries) ... November 20 ... November 19  
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Steamers. Antwerp. Rotterdam. Hamburg. Southampton.  
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"Athenian ... November 1 ... November 7 ... November 14  
"Moore ... November 1 ... November 7 ... November 14  
"Green (twice a week) ... November 15 ... November 21 ... November 28

\* Calling at Madeira. \* Via Madeira and Teneriffe. \* Via St. Helena. Free railway tickets from London and Plymouth to Southampton. Cheap Tickets are issued for Passengers' Friends. The Union Line Express is despatched from Waterloo Station (Main Line Platform) every Saturday.

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## NEWS FROM WEST AUSTRALIA.

CUTTINGS FROM THE LOCAL PRESS.

(From the Mining Journal of Western Australia.)

**A** MENZIES property on the proved line of country that has not yet been offered for sale is the Leviathan lease, consisting of 48 acres, and owned by Mr. F. C. Bealy, of Perth. Under the guidance of Mr. Hamilton Fisher, M.E., a lot of good sound development work has been done. One shaft is down 180 feet, and shows two reefs—one in the shaft, and the other in an easterly crosscut. Several small gold-bearing leaders have been met with in a drive from the 95 feet level, and will, no doubt, junction into a big ore body. A second shaft on Afrikander line of reef is down 96 feet, showing a lode over 5 feet wide, with no sign of the hanging wall. The Afrikander lease has been proved to a depth of 170 feet, at which level it carries good gold. A third shaft on the Leviathan is sunk on a small rich vein, having a strike to the north, and in all about 381 feet of sinking and 138 feet of driving have been done on the leases. There are five distinct lodes on the blocks, and about 150 tons of stone, good enough for 2½ ounces to the ton, is at grass. The properties adjoin the well-known Alpha lease on the west, and are situate about 1 mile south of the township of Menzies.

Mr. Hamilton states that the lode in the Boulder was not cut in the shaft but on the footwall. He is satisfied that the lode is now taking a true underlie to the east. The stone is highly mineralised at the bottom, and it all looks like lode matter. The steam plant on No. 4 shaft on the south boundary will be started in a couple of week's time, and sinking, which has been discontinued owing to the influx of water, will then be resumed. The 20 head of stamps are running full time, and with the present find of water should be able to run 40 heads.

The Boulder Main Reef has made a rich find at a depth of 140 feet in the air shaft. The lode has an underlie into the pit, and the first few shots put in revealed the richest stone ever seen in the mine. The stone is coated with deposited gold, and flour-like particles of the metal form bunches all through the cleavage of the lode. The main shaft has been pushed down as rapidly as possible, and is now 130 feet deep, and a little water is making in the bottom. Crushing operations are still being carried out at the Leviathan battery.

Some good alluvial gold is still being got at Bardoo, and during last week a 4 ounce slag and several smaller pieces were obtained. The gold is being obtained from a cement formation similar to that at the White Feather at a shallow depth.

The Lake View shaft has been stripped and retimbered to a depth of 160 feet, and should be completed in two weeks. A good supply of water is being raised in the shaft. Ten heads of stamps are working, and the tailings pump introduced in place of handling slimes is working successfully.

The Rosehill United Gold Mines are looking well, a closely-timbered shaft is down to 83 feet on lease 226, and the drives at the 75 feet level are looking well.

The Crown United at Coolgardie has some good machinery erected now, consisting of 10 heads of stamps with specially constructed appliances for saving fine gold. The whole plant is driven by a 80 horse power engine.

Mr. George Gray will start on a tour through the northern district this week, and will be away some three or four weeks.

## METAL CIRCULAR.

Messrs. S. W. ROYSE and Co., in their report, dated Manchester, October 21, state:—Chemicals. The spot demand for chemicals in the home trade is not heavy at present, and enquiries from the United States are being held back pending the result of the Presidential election there. There is, however, a stir in business with certain other ports, the season for which will shortly close. Contracts continue to be placed for next year's delivery, but in the matter of alkalis many buyers prefer to adopt a waiting policy. Bleaching powder is firm for next year. Prices have fallen for early delivery, and are now about the same for this year and next. Caustic soda is dull, though the production has been considerably reduced, and there is very keen competition for all orders. Ammonia alkali remains steady, with a fair demand for both early and forward delivery. Chlorates of potash and soda are selling well at present low figures. In the tar products branch the tone at present is quiet. Benzoles are easier, and considerable inducements are necessary to effect forward sales. Naphtha is steady at the advanced prices, but not active. Oleostea is dull, and at only low figures can buyers now be found. Pitch is stagnant—both buyers and sellers appear to be waiting for a move in values—buyers, however, being rather the stronger. Crude carbolic is steady, with a fair amount of business passing, and crystals are firmer. Sulphate of ammonia is again lower. Murate of ammonia is also easier, but carbonate remains firm. Sulphate of copper is strong, and an advance of 15s. per ton is asked for next year's delivery. Green copperas is quiet, but supplies are only small, and values are fully maintained. Brown acetate of lime is firm at the advance, business, however, being almost nil, consumers preferring to work from their stock. Lead salts have improved; nitrate is in better demand, and brown acetate has advanced considerably, whilst white acetate and litharge are firm. Makers of borax have by agreement advanced their prices. Carbonate and caustic potash have a fair enquiry, but not much business resulting; consumers are ready to contract, but not at the advanced prices now asked. Frustates of potash and soda are steady and unchanged in value. Minerals. There is a good business passing in iron ore, and prices are firm. Tonnage is scarce, and this is at present affecting shipments from the mines in Spain. The imports for the nine months ended September 30 last show an increase in weight of 939,764 tons, and in value of £761,000 over those for the corresponding period of last year. There is nothing new to report in chrome and manganese ore; the demand is good, and values are unchanged. Imports of foreign sulphur have improved during September, the total imports for the nine completed months of this year being, however, some 1439 tons less than during the corresponding period of 1895; the market remains firm at the advance, and efforts are now being made to end also the competition amongst the producers of Sicilian refined sulphur, present arrangements only applying to the lower qualities. Contracts for China clay are now being freely placed for next year; shipments are, however, at present restricted owing to the difficulty of obtaining vessels, and to the high rates of freight ruling. Metals. The demand for pig iron has been strong throughout this month, and prices have advanced rapidly, the total increase in values being some 1s. 6d. per ton in both Scotch and Cleveland iron. A good business continues to be done, the outlook is considered very satisfactory, and the tendency is for still higher figures. Shipments of pig iron from Middlesbrough during the last few weeks have been extremely heavy, greater in fact than during any similar period in the history of the port. The manufactured iron trade is good on all sides, and especially in the Midlands. In the higher priced metals there is nothing of striking interest to report. Tin has advanced some 15s. per ton, and is at present steady. Copper has been giving way slowly, and in the face of a decrease in the visible supply, but is now improving. Spelter also has receded some 7s. 6d. per ton. Lead is slightly easier.

**THE RUSSIAN COAL TRADE.**—Efforts have been made by coal producers in South Russia to induce the Russian railway authorities to reduce the freight charges on coal exported from the Don District of Rostomania. So far the railway authorities have declined to make any reduction.

**BELGIAN BLAST FURNACES.**—Out of 44 existing blast furnaces in Belgium, 34 were in operation at the commencement of the present month; 15 in the Charleroi district, 13 in the L'ège district, and six in the Luxembourg district. Of those in operation the production per 24 hours is 13, fur acres 1130 tons of forge pig, three 200 tons of foundry pig, and 18 1730 tons of steel pig.

**THE CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA (LIMITED)** notify that the transfer books of the ordinary shares of that company will be closed from the 2nd to the 14th of November, both days inclusive, for the purpose of dividend.

## BUSINESS CARDS.

## AERIAL ROPEWAYS.

OTTO SYSTEM.

R. E. COMMANS (late Commans and Co.), 6, Queen Street Place, London, E.C.

## ASBESTOS.

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Post Office Address: Box 589, Telluride, Colorado, U.S.A.

Cable Address: "Van," Telluride, Colorado, U.S.A.

REPORTS AND EXAMINATIONS ON MINES. References: The Columbia University School of Mines, New York, and the Bank of Telluride, of Telluride, Colorado.

## E. HENRY DAVIES, F.G.S.,

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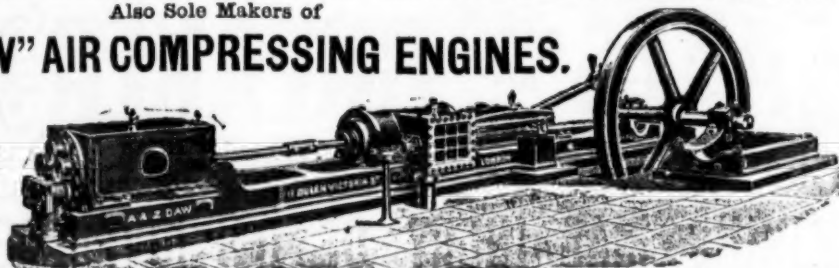
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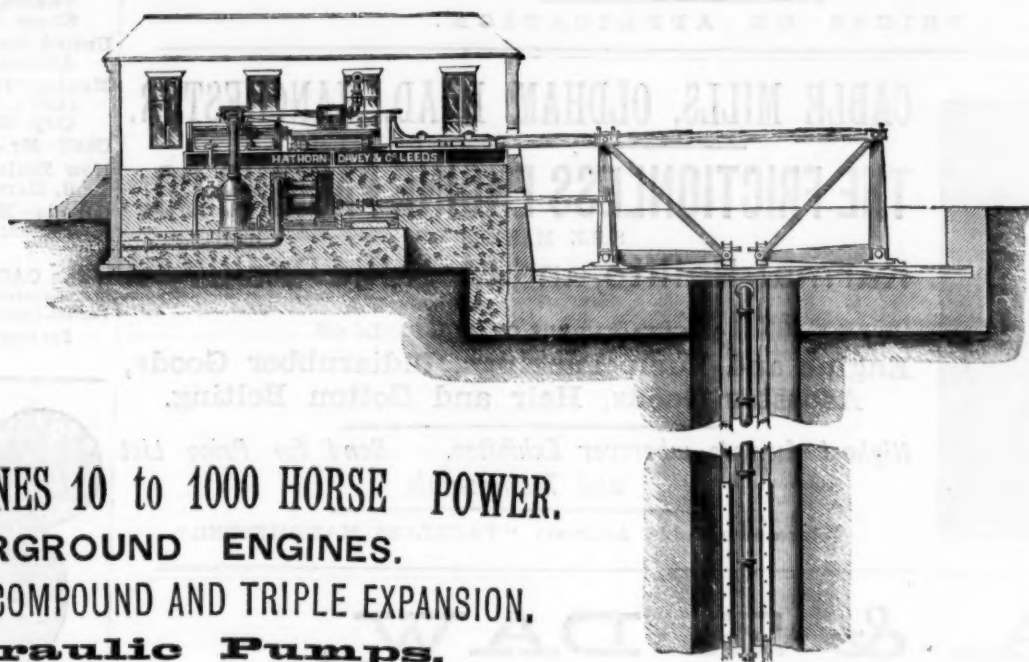


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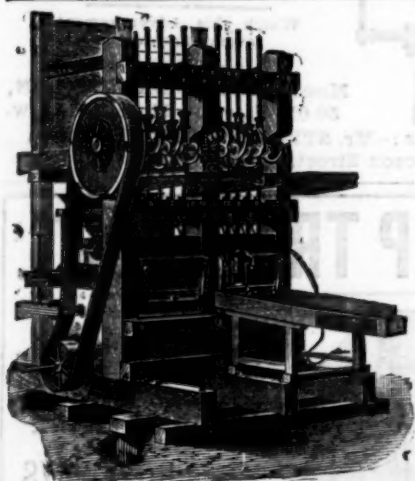
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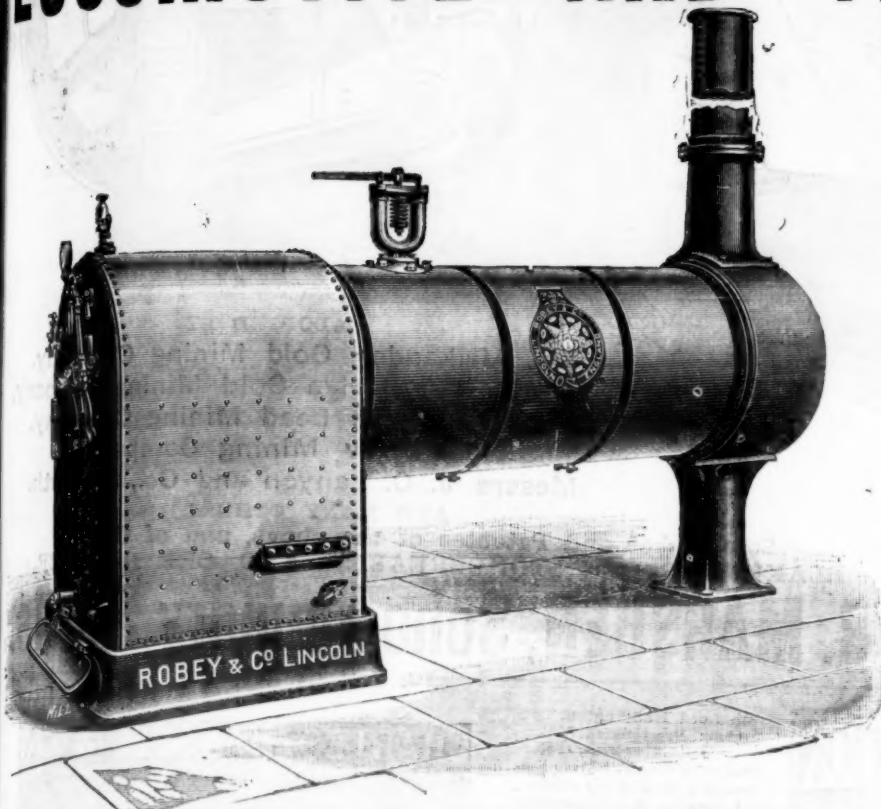
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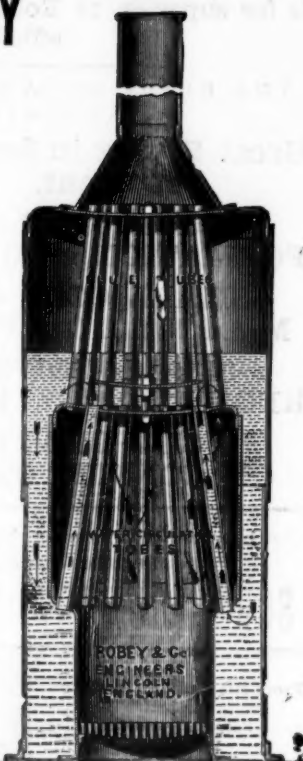


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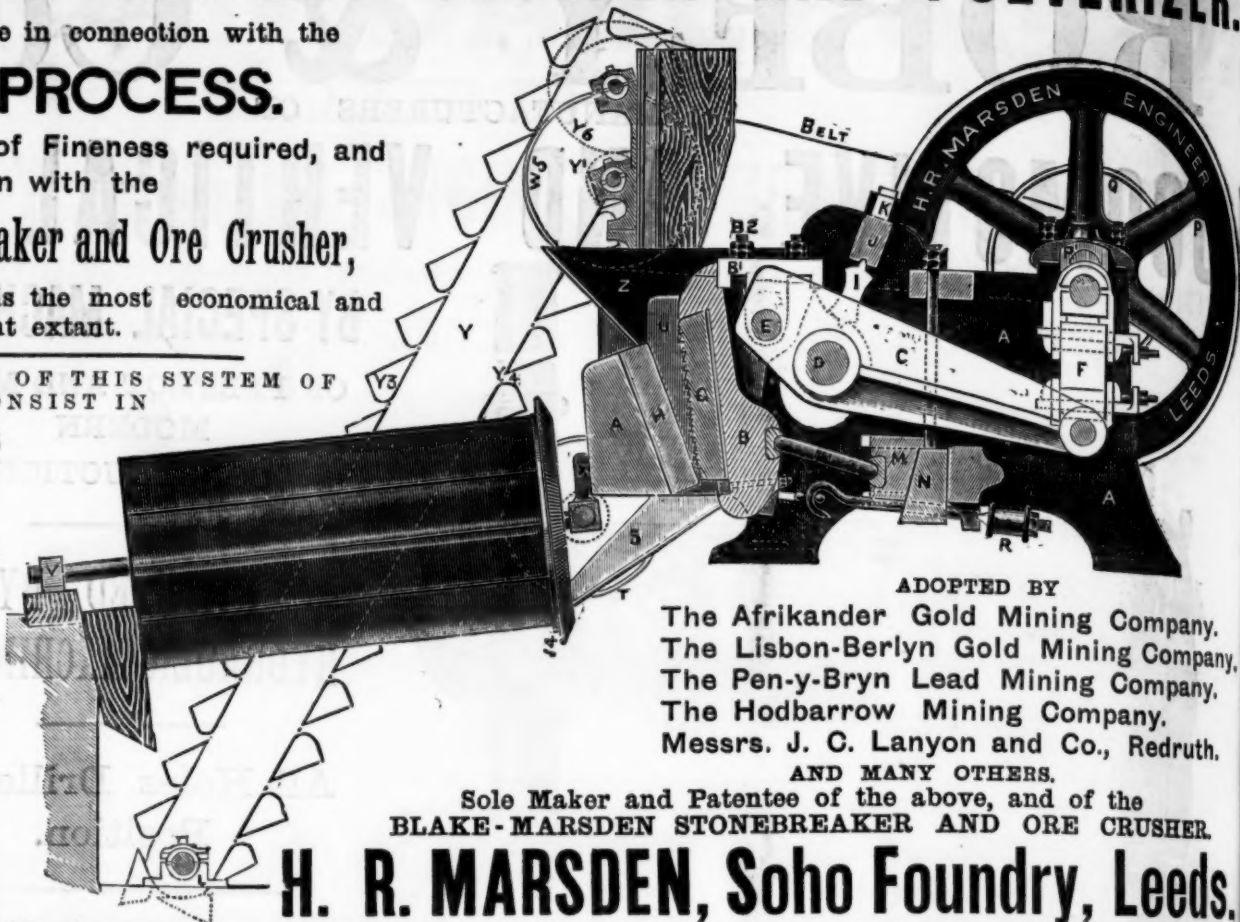
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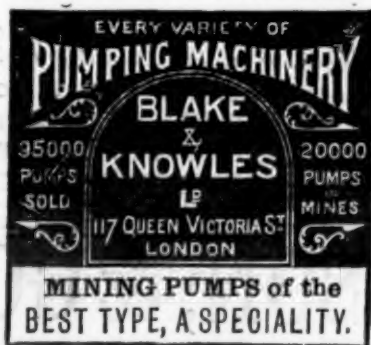
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